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DISCUSSION PAPER NO. 255

The Importance of the Livestock and Meat Processing Industries to Western Growth

By William A. Kerr and
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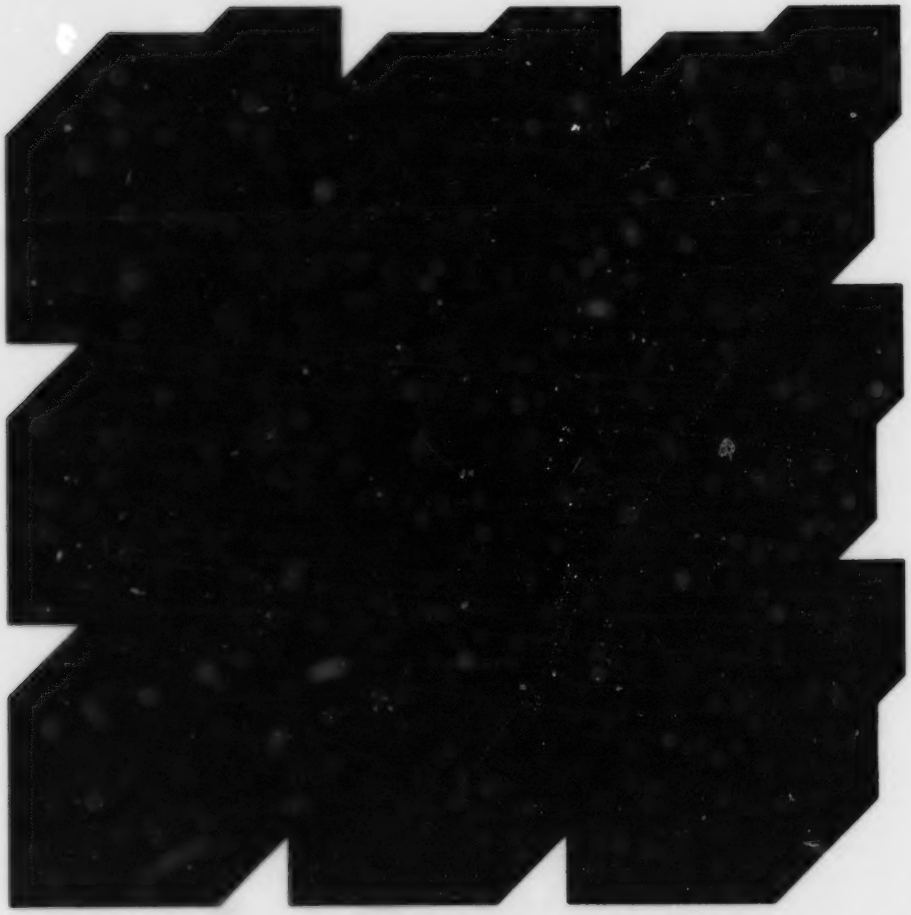

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RÉSUMÉ

Le secteur de l'élevage de bétail a toujours contribué d'une manière importante à la croissance de l'économie de l'Ouest canadien. En 1981, la vente du bétail a rapporté plus de 2,5 milliards de dollars de recettes aux éleveurs de l'Ouest. Cette somme représente plus de 25 % du total des recettes agricoles de la région. L'industrie de la transformation du bétail apporte, pour sa part, quelque 375 milliards de dollars de valeur ajoutée par année et représente 19 % de toute la valeur ajoutée du secteur de la fabrication. En outre, cette industrie fournit quelque 12 000 emplois, ce qui en fait la première source d'emplois et la principale activité de fabrication des provinces des Prairies.

Le secteur de l'élevage a été d'une importance toute particulière pour la croissance économique de l'Ouest canadien du fait qu'il s'agit d'une activité d'exportation nette. Trois grands marchés ont toujours existé et existent toujours pour l'excédent de production. Ce sont les marchés traditionnels des provinces centrales, des Maritimes et des États-Unis. Le Japon est aussi devenu, plus récemment, un marché important, surtout en ce qui concerne le porc. Le commerce à l'extérieur est une activité fort complexe : les produits peuvent en effet sortir sous diverses formes, qu'il s'agisse de jeunes veaux ou de viande de boeuf entièrement transformée. La composition de la production est donc tout aussi importante que le volume des produits, puisque chacun de ceux-ci comporte une part

différente de valeur ajoutée. Lorsque diverses options existent à l'égard de la nature du produit exporté, la région fournisseuse et la région acheteuse ont toutes deux tendance à réaliser chez elles la plus grande partie possible de la valeur ajoutée. Le commerce entre l'Ouest canadien et les marchés des provinces centrales et des États-Unis est dominé par des facteurs de ce genre.

Or, les politiques gouvernementales ont pour effet de modifier la valeur ajoutée qui se réalise dans chaque région ou dans chaque pays. Mais pour l'Ouest canadien, les changements qui en résultent sur le plan de la valeur ajoutée varient d'un produit à l'autre, de sorte qu'il est impossible de dégager des structures définies. C'est le commerce avec le Japon qui comporte le plus haut taux de valeur ajoutée, mais il est par ailleurs soumis dans ce pays à des politiques gouvernementales qui ont pour effet de restreindre la demande totale.

Une tendance accrue à l'autonomie provinciale et à une balkanisation de l'agriculture - à quoi il faut aussi ajouter une concurrence plus vive de la part des États-Unis - ont abouti à la possibilité de voir se refermer beaucoup sur elle-même la production du bétail dans l'Ouest canadien. De plus, une baisse de la consommation intérieure par habitant dans le cas des produits de l'élevage en a fait augmenter considérablement la capacité excédentaire depuis la fin des années soixante-dix.

Voilà comment la contribution future de l'élevage au développement économique de l'Ouest dépendra de la découverte de marchés pour ce potentiel refermé sur lui-même. Puisque la balkanisation agricole du Canada semble se poursuivre, il est peu vraisemblable que l'on assiste à une expansion du marché traditionnel des provinces centrales. Les États-Unis et le Japon se montrent toutefois fort prometteurs. L'Ouest du Canada, et tout particulièrement l'Alberta, peut alimenter la Californie à moindres frais que beaucoup de fournisseurs américains. Puisque l'insuffisance de boeuf de la Californie correspond à peu près à toute la production du Canada, l'obtention d'une part relativement faible de ce marché aurait elle-même un impact considérable sur l'Ouest canadien. La consommation per capita des viandes rouges au Japon est considérablement inférieure à celle d'autres pays où le niveau des revenus est comparable. Là encore, un très faible relâchement des restrictions japonaises à l'importation pourrait produire une vaste expansion des marchés de l'Ouest. Si le secteur de l'élevage et des produits de l'élevage de l'Ouest canadien peut profiter de ces marchés, il connaîtra alors une croissance.

Les projections fondées sur l'expansion du marché strictement local de l'Ouest canadien n'appellent que peu d'investissements nets dans ce secteur avant le milieu des années 1990. Par ailleurs, un succès modéré sur le marché japonais aboutirait à une production à pleine capacité vers la fin de la présente décennie et exigerait donc des investissements nets un peu auparavant.

SUMMARY

Historically, the livestock industry has made a significant contribution to the growth of the economy of Western Canada. In 1981 western farm cash receipts from livestock sales were over $2.7 billion. This was over 25% of total farm cash receipts in the region. The livestock processing industry adds approximately $375 million in value-added annually and contributes 19% of all value-added from manufacturing. The processing industry provides about 12,000 jobs, making it the largest employer and the leading manufacturing industry in the prairie provinces.

The livestock industry in Western Canada has been particularly important to economic growth because it is a net exporter. There have been, and still are, three major markets for product surplus to local requirements. These are the traditional markets in Central and Maritime Canada and in the United States. Recently, Japan has become a major market, particularly for pork. Extra-regional exports are complicated. Product can move out of the region in a wide variety of forms, from weaned calves to fully processed beef. Thus, the product mix is as important as volume of movement, since each product represents a different amount of value-added. When a number of options are available for the type of product moved, there is a tendency for both the supplying and purchasing regions to attempt to maximize the value that is added in its own region. Trade between Western Canada and the Central Canadian and U.S. markets is dominated by such considerations. Government policies are used to alter the value-added component produced in each region or each country. In Western Canada, the resulting changes in value-added are commodity specific. Hence, no clear pattern can be discerned. Trade with Japan is at the highest order of value-added but subject to strict Japanese government policies designed to restrict total demand.

Increasing trends toward provincial self-sufficiency and agricultural balkanization, combined with increased competition from within the United States has led to

considerable "shut-in" potential for livestock production in Western Canada. In addition, falling domestic per capita consumption of livestock products has led to considerable excess capacity since the late 1970's.

Hence, the contribution of the livestock industry to western economic development will depend on finding markets for the "shut-in" potential. As the process of Canadian agricultural balkanization appears to be continuing, expansion of the traditional Central Canadian market seems unlikely. The United States and Japan, however, have considerable potential. Western Canada, especially Alberta, can supply California cheaper than many suppliers in the U.S. As the California beef deficiency equals approximately the entire Canadian production, gaining even a relatively small share of this market would have a significant impact on Western Canada. Japanese per capita consumption of red meat is considerably below other countries with similar levels of income. Again, even minor relaxation of Japanese import restrictions could lead to a large increase in western markets. If the Western Canadian livestock and livestock products industry can take advantage of these markets, then the industry will experience growth.

Projections based on the expansion of only the local Western Canadian market suggest little or no need for net investment in the industry until the mid 1990's. Moderate success in the Japanese market would lead to full utilization of capacity near the end of this decade. Therefore, net investment would be required somewhat earlier.

THE IMPORTANCE OF THE LIVESTOCK AND MEAT PROCESSING INDUSTRIES TO WESTERN GROWTH

I. INTRODUCTION

The contribution of any industry to regional economic growth is a function of three identifiable and dynamic processes: (1) changes in the volume of production; (2) changes in the amount of processing undergone by the product; and (3) changes in the magnitudes of the indirect linkages between the industry and other industries or sectors.[1] Thus, the impact of an industry is not a simple function of the volume of production; indeed, an industry whose total volume of production is decreasing may still contribute to overall growth if the degree of processing, and thus value-added is increasing. An industry where all three processes are increasing is likely, of course, to have the greatest impact upon economic growth within the region. Although these are very basic concepts, they need to be made explicit at the outset because, for the latter part of the 1980's and beyond, the Western Canadian livestock industry may be faced with the prospect of not being able to rely upon the traditional avenue of growth (increased production) and instead, must exploit possibilities which exist from increased processing. Such a change in emphasis will, of course, lead to the altering of inter-industry linkages.

The ability of the western livestock industry to make the adjustment from expansion (due to increased production) to increased value-added will determine its contribution to the growth of Western Canada. Such an adjustment is likely to be difficult because growth based on increasing value-added is a much more complicated process than growth based on increased volumes of production. If the market for a product in its existing form is increasing, then industry expansion can be accomplished through the use of existing technology and time tested methods. As such expansion is simply the fulfillment of increased demand, marketing receives a low priority. Although

the process of increasing the size of the industry may not be without problems, such problems tend to be bottlenecks which can be overcome in time. On the other hand, growth resulting from increasing value-added requires the development and use of new technology, aggressive marketing and flexibility. Those working in the industry will be expected to learn new and more comprehensive skills than in the past. It is important not only for the industry to realize this, but also for government policy makers and regulatory agencies, since the full exploitation of such changes will require tolerance of the mistakes which inevitably result from "learning by doing". An increased pace of decision making to accommodate rapidly changing market conditions and a willingness to alter the mix of support services in line with new developments will be necessary and the resulting value-added will lead to an expansion of the non-primary processing and service sectors. In the best possible scenario, a successful exploitation of the opportunities to increase value-added will eventually lead to increased volumes of product demand, mainly due to foreign markets.

In Part 2 of this report those factors which have historically contributed to the growth of the Western Canadian livestock industry will be identified. Part 3 will examine the prospects for the continued contribution of those factors to industry growth. Included is an analysis of current or proposed government policies. New economic factors which could be exploited to ensure continued growth in the industries are examined in Section 4. Section 5 presents a brief summary and some recommendations by way of conclusions. The report encompasses the four major commodity groups which comprise the livestock industry in Western Canada: beef cattle, hogs, poultry and sheep. Whenever applicable or possible, data is reported separately for each of the four western provinces.

II. HISTORICAL DEVELOPMENT

The four provinces of Western Canada are net exporters of livestock and livestock products. Hence, growth of the industry has been a function of developments not only in Western Canada itself, but also developments in external markets and the transportation systems to those markets. For the purposes of this study we will identify three markets which have shaped and will continue to influence the evolution of the livestock industry in Western Canada: (1) the market in Western Canada (from this point on referred to as the local market); (2) the market in Central and Eastern Canada (the eastern market); and (3) the market outside the country, including both the United States and offshore (the export market). The eastern market has traditionally been the major recipient of livestock and livestock products surplus to the needs of the local market. In recent years, however, exports have become increasingly important in market development.

Product destined for the local market is largely grown, slaughtered and processed into its various forms within the local market. Movement of product outside this market, however, is very complicated and as such one cannot speak with any generality about this flow. An example from the beef industry should, at this point, provide some insights into the complexity of this issue.

The complications arise from the large number of options available for the organization of the beef industry in Canada. The west is a surplus agricultural area, the east is a deficit area. The problem is how one transfers the surplus from west to east. The great surplus of Western Canada is grain. Conceivably this transfer could be accomplished solely by transportating grain to the eastern market to be fed to calves born in Central or Eastern Canada. Under this scheme the western livestock industry would be self sufficient and there would be no eastward movement of cattle or beef products. This might be thought of as the "zero percent value added scenario" for

western agricultural surpluses. Indeed, a small portion of the grain moved out of Western Canada is used for just such purposes.

An alternative organizational structure would be for calves to be born and weaned in Western Canada and then transported to Central and Eastern Canada to be fed, in part, on grain grown in Western Canada and then slaughtered and processed in the east. On the other hand, calves could be born and fed out in the west and shipped live to the east for slaughter. Or, they could be slaughtered in the west and the carcasses shipped east for further processing for consumers. The further alternative would be to have these carcasses broken down in the west into "primal cuts" and then "boxed" and shipped to the eastern market for final processing into retail cuts, convenience foods and fast food products. Each of these organizational structures provides additional value-added in the west and a greater contribution to western growth. What might be termed the "one hundred percent value added scenario" would have all facets of the livestock industry, from the growing of the grain input to the processing of consumption ready products, carried out in the west and only the final product shipped east.

What is important is not that all these options exist, but that all of them operate or have operated simultaneously in varying degrees. It is not only the volume of beef cattle produced in Western Canada which determines the contribution of the beef industry to western growth, but also the mix of agricultural surplus which is transferred to Central and Eastern Canada. This mix is partly determined by relative prices, consumer tastes, available technology, relative transportation costs and the availability of transportation services, and partly determined by federal and provincial government policies.

A similar range of options is available for hogs, poultry and sheep. The export market can also be similarly organized but the options are further limited by the import regulations of foreign countries, each of which are different.

Thus any discussion of the contribution of the livestock and processing industry must be conducted with both quantity of primary production and value-added by the

secondary and service sectors in mind. In the past, steady growth in the quantity of production has meant that the issues of value-added have often been neglected. Currently, however, as the growth in quantities has slowed, the issues of value-added have become more prominent.

A. The Local Market

The main contributing factors to the growth of the local market for livestock and livestock products can be summed up in Table 1. Over the period 1960-1981 the population of Western Canada grew approximately 50%. In addition, incomes were rising rapidly and this, combined with the relatively high (at least for agricultural commodities) income elasticity of meat (lamb 0.68, turkey 0.52, chicken 0.15, pork 0.13, veal 0.51, beef 0.51)[1] led to an increase in per capita consumption of meat equalling approximately 25 kg over the same period. Population increased by 2,300,000 thus requiring an approximate increase in yearly production of 60,000,000 kg of meat in general. Per capita consumption of beef and veal increased approximately 8 kg, thus requiring an additional 18,400,000 kg of meat. This translates into roughly 62,000 additional beef cattle. Pork consumption increased approximately 8 kg per capita and poultry production 10 kg per capita. Lamb consumption, on the other hand, has declined approximately 50%. In total, the local market for meat has grown approximately 7.5% over the 1960-1981 period.

(1) The Beef and Pork Industries

Table 2 suggests that the western beef and pork industries have been able to meet the growing demands for these meat products and the region, as a whole, remains self-sufficient in these products. Within the west, the beef cattle slaughter percentages suggest that Manitoba and Saskatchewan are approximately self-sufficient while British Columbia is in a deficit position. This is made up from Alberta. The proportion of total

Canadian hog slaughter done in the four prairie provinces is greater than the province's proportion of people. British Columbia is in deficit and is supplied primarily from the other western provinces.

(2) The Sheep Industry

As in the rest of Canada, the western sheep industry does not produce sufficient product for local requirements. Imports make up about 60% of total domestic requirements. This can be seen in Table 3. Since 1962, the sheep industry in Western Canada has declined by about 70%. In recent years the rate of decline has fallen and the industry may be stabilizing at a lower level. Unlike other meat products (see Table 1), per capita consumption of lamb has declined from about 1.5 kg per year in the early 1960's to about 0.7 kg in 1982.

The sheep industry in Western Canada is beset by a number of problems, the major of which is high production costs. The raising of sheep is still very labour intensive, largely due to the problem of predators. Sheep flocks are usually raised on marginal grazing lands which are contiguous to unfarmed areas. These large unorganized areas make predator eradication almost impossible. The major predators are coyotes which are generally too small to damage the cattle that share similar grazing lands. Sheep, on the other hand, must be continuously watched to protect them from such predators which adds significantly to the cost of production. If they are not guarded, then large losses are likely, leading to increased costs per unit.

The move away from pasturing sheep toward intensive production in confinement is slow. Large capital investments are required and producers in an industry of widely fluctuating returns and small operations have not been able to adequately fund such a transition. As a result, sheep production is most often pursued as a part-time or a sideline business. For example, every sheep producer in Manitoba supplements his production with a diversified agricultural base or another full-time career. Cost of

slaughter for sheep is also higher per pound of meat than it is for cattle or hogs. Since the sheep industry has been on the decline, there has been little incentive to invest in development of new technology. Consequently, sheep production has become less competitive over time resulting in retail prices for lamb which are higher than those for beef, pork and chicken.

At times, western sheep producers have had difficulty bringing their product to market as the smallness of the industry meant that meat packers would only schedule sheep slaughter at irregular or widely spaced intervals. This has led to increased costs in holding and feeding slaughter animals or increased animal losses while they are stressed at packing plants awaiting slaughter. The operation of a government sheep slaughtering facility at Innisfail, Alberta, has alleviated some of those problems for producers. The long haul to the Innisfail plant, however, adds to the relative cost compared to beef or pork producers that can utilize more localized slaughter facilities.

In addition, sheep producers in Western Canada, as well as in the rest of the country, face competition from offshore imports of lamb, primarily from Australia and New Zealand. With few predators, abundant forage, lower labour costs and a large industry which can utilize economies of scale, these countries can deliver frozen product into Canada at a considerably lower price. Although the imported frozen product is less preferred by consumers than fresh domestic lamb, the price difference makes the imported product appear attractive to consumers, especially when used in sauced or spiced dishes. The industry has also realized that the average Canadian cook is not knowledgeable about alternative uses of lamb in cooking, thus limiting the use of the product. The problem seems to be increasing over time as less use leads to increased ignorance, especially among younger cooks.

In short, it would appear as if the sheep industry will not likely add significantly to Western Canadian growth in the near future. None of the problems identified above has been adequately addressed in the past and there appear to be no solutions on the

horizon. Probably the best that can be hoped for is that the industry has stabilized and that it will not continue to shrink and detract from western growth.

(3) The Poultry Industry

One Western Canadian livestock industry which supplies the local market only is the poultry industry. Chickens and turkeys make up the overwhelming majority of production. As can be seen from Table 1, poultry meat, as a percentage of Canadian meat consumption, has been increasing over time and currently comprises 23%.

Broiler (chickens produced for meat) production in Western Canada is undertaken on a large scale with farm production units of not less than 20,000 birds. The growing period is about seven weeks thus allowing the production of 6.5 crops of broilers per year from one facility. Broiler production is the best example of a factory situation in primary agriculture one is likely to find, with temperature controlled buildings and automatic feeding, watering and lighting [2].

Production of chicken meat in Western Canada has increased from 113,533,000 pounds in 1962 to 272,186,000 pounds in 1982. As can be seen from Table 4, growth has been relatively steady over the period and roughly equivalent to the increase in population and per capita consumption. In addition, the price of chicken relative to other meat commodities has been falling. Saskatchewan and Manitoba, in most years appear to have a percentage of production approximately equal to their percentage of population. Alberta has slightly more production per year compared to its population and B.C. slightly less. In fact Alberta has traditionally supplied parts of the B.C. interior with broilers.

The broiler industry operates under a system of provincial supply management marketing boards. Since 1979, the industry (except in Alberta) has operated within the structure of the Canadian Chicken Marketing Agency. The Agency is supervised by the National Farm Products Marketing Council and is subject to the Farm Products

Marketing Agencies Act of 1972. The function of the Agency is to establish national and provincial quotas and to regulate interprovincial movements of chicken in an attempt to achieve a nationally stable market environment. Provincial boards allocate quota within provinces.

Supply management marketing boards have had two major implications for the contribution of the broiler industry to Western Canadian growth. First, even before the establishment of the national agency, provincial boards had restricted quantities of production and thus increased product price to the point where Canadian chicken was not a competitive export product [3]. Hence, any expansion of the industry is restricted to growth in the Canadian market.

With the establishment of the Canadian Chicken Marketing Agency, free movement of product between provinces was further restricted. Although historic levels of interprovincial exports were allowed for, any increase in these exports seems unlikely. The allocation of provincial quota is conducted annually. Changes in quota allocations over time are supposedly made according to the following set of criteria: (1) changes in consumer demand; (2) provincial ability to meet its allocation; (3) requirements within each market area; (4) self-sufficiency level of each province; and (5) comparative advantage.

Although the Agency has established these criteria, "there is no method which is consistently followed to determine overbase allocation. Allocations of national quota are appealed and renegotiated according to the internal pressures of the agency" [4, p.4]. Given that each province's producers wish to protect their market, re-allocations of quota between provinces, which might be suggested from changing factor prices, are unlikely. In fact, there seems to be considerable resistance to the re-allocation of quota due to population shifts. This is the major reason why Alberta has remained outside the Canadian Chicken Marketing Agency. In the late 1970's and early 1980's, as population was shifting from Central and Eastern Canada to Alberta, the Canadian Chicken

Marketing Agency was unable to secure a reduction in the percentage of quota allocations in the east for transferr to Alberta. If one examines Table 5 which sets out the allocations for each province, the percentage allocations for Alberta actually declined over the period 1979-1983, at the same time as the population of the province was increasing.

It is evident then that growth of the western broiler industry will be restricted, at best to the rate of population growth and any increases in local per capita consumption. Neither the export market nor markets outside Western Canada seem feasible avenues for expansion. The broiler industry may experience some expansion as the rate of technological change has been faster in the poultry industry than in pork, beef or sheep, but any increase in broiler consumption can only replace competitive meat products so that there would be no net gain to Western Canada.

The production of turkeys in Western Canada is divided into two production systems, one producing large birds for the Christmas and Thanksgiving holidays, and the other producing the smaller broiler turkey for the rest of the year. As can be seen from Table 6, the output of turkey meat in Western Canada has remained relatively constant over the period 1962-1982. Per capita consumption has remained about 4.5 kg per year.

As with broilers, turkey production is regulated by a system of provincial supply management boards with powers to determine quantity of production and prices. In December, 1973, all provinces signed a federal-provincial agreement for a national marketing agency. The Canadian Turkey Marketing Agency became operational in 1974 and has authority over inter-provincial and export trade. Quotas are established for provinces based on percentages of nationally determined quotas. As with the Canadian Chicken Marketing Agency, the turkey board suffers from rigidities in provincial production patterns and a self-sufficiency bias when market shares are negotiated [5]. Hence, it would seem that growth in turkey production will be restricted to the rate of growth of population and any growth in per capita consumption.

Per capita consumption of turkey meat has remained relatively constant over time. Recently, however, considerable use has been made of turkey rolls for luncheon meats and more turkey is utilized in other processed meat products. To the extent that these products become more popular, the per capita consumption of turkey meat will increase. Again, however, such an expansion of turkey consumption is only likely to come at the expense of other meat products.

To sum up the local market then, we have a pork and beef industry which is surplus to local production and has responded to past increases in demand by increasing production. On the other hand, the sheep industry, faced with high and increasing productions costs, has been declining in the face of both the growth of western population and the growth of real incomes. It may be that the decline of the industry has slowed and even may have stabilized. In general, however, the industry has detracted from growth. The poultry industry has been unable to attain access to extra-regional and international markets, not because of the lack of technical abilities or resource constraints, but due to the rigidities of the national marketing agencies to which the provincial regulatory boards belong.

B. The Eastern Market

As suggested above, only cattle, hogs and their respective products are moved out of Western Canada on a continuing basis. There are two outlets for this product - the United States and offshore markets and the market in Central and Eastern Canada. The latter market will be examined first.

The movement of cattle or beef from Western Canada to the eastern market takes place in a number of forms. These can be summarized briefly below, and are ranked starting with the lowest value-added accruing to Western Canada:

(1) calves weaned in Western Canada and shipped live to the eastern market;

(2) cattle fed to slaughter weight in Western Canada and shipped live for

slaughter and further processing;

(3) cattle slaughtered in Western Canada and the carcasses shipped for final processing;

(4) slaughter carcasses from Western Canada broken into "primal cuts" and shipped in "boxed" form for final processing.

Some final product does move to the eastern market for direct consumption, but the bulk of movements are in the four forms suggested above.

The growth and value of the beef industry to Western Canada is determined, in part, by the relative mix of such products moving to the eastern market. As can be seen from Table 2, Western Canada with 29% of the population has about 63% of the cattle herd. The cattle herd is the basic production unit and is an indication of the total numbers of cattle produced for sale each year. On the other hand, slaughter in Western Canada represents only 54% of the Canadian total. Throughout the 1960's and early 1970's both the cattle industry and the meat packing industry experienced considerable growth. Since the late 1970's, however, the growth in the industry has slowed and per capita consumption of beef has declined from a peak in the mid 1970's (see Table 1). The Canadian beef cattle industry has declined in absolute terms but the percentage of the cattle herd in Western Canada has remained relatively constant at about 63% since 1972. The percentage of slaughter has declined somewhat and this has resulted in considerable concern among western cattlemen and meat packers.

Live cattle move to the eastern market for two purposes: to be slaughtered or to be fed out. Table 7 shows the movement of both feeder cattle and slaughter cattle from west to east over the period 1962 to 1982. In the early part of the period, shipments of both types of animals increased with the growth of the cattle industry. Movements of feeder cattle have continued to increase, even with the decline in the cattle industry. This suggests that a greater percentage of cattle are being fed out and slaughtered in Central and Eastern Canada. As feeder cattle represent the product with the lowest

value-added, continued expansion of this market, while good for the cow-calf operator, adds little to the overall growth of Western Canada. On average, each steer carried to slaughter weight adds an incremental $208 in value-added to Western Canada[2] (based on 1982 prices).

The reduction of slaughter cattle shipments discussed above results in two offsetting influences. One result is that some animals are shipped as feeders to be fed out in the east causing a reduction in value-added for Western Canada. This is partially the result of transportation policies and partially the result of the desire of provincial governments in Central Canada for an expanded livestock industry, and in particular, the Quebec government's goal of increased self-sufficiency. These will be discussed in detail later. The second result is that some of the animals are slaughtered in Western Canada instead and then shipped, with the resulting increase in value-added. This expansion in slaughter is largely the result of an increase in slaughter facilities in the region. The relative strengths of the two trends is impossible to discern given the widely fluctuating state of the industry.

The majority of beef moved to the eastern market moves as hanging beef in carcass form. As can be seen from Table 2, with 29% of the population in 1982, Western Canada slaughters 54% of the beef animals in Canada. In 1977, however, 57% of the beef slaughter took place in Western Canada and the percentage of population was only 27%. It would appear then that the western processing industry is losing part of its market share to the industry in Central and Eastern Canada. If the percentage of slaughter had remained at the 1977 level it would have meant an increased slaughter of approximately 110,000 (3% of 3,706,000) animals in Western Canada.

Although most of the beef moving to the eastern market is in the form of carcasses, approximately 35 to 40 percent goes as boxed beef. This has been an increasing trend over the past few years and adds considerably to the value added of beef

shipments. The Quebec market accepts primarily carcass beef, while most of the boxed beef goes to Ontario and the Maritimes.

The most significant single factor discouraging the growth of the Western Canadian livestock industry has been in the pork industry. In 1962, forty-four percent of all hog slaughter was carried out in Western Canada (with only 26% of the population), in 1982, hog slaughter in Western Canada had fallen to 27% of the total Canadian slaughter, indicating that Western Canada is roughly self-sufficient. Unlike beef, movement of pork product was to a large extent at the highest order of value-added - hams, packages of bacon, etc. Little, or no, movement of pork takes place at present. On the other hand, over the same period, pork slaughter in Quebec increased from 18% to 37% of the national total [6]. Hog production has shifted in relative importance from the western provinces to the province of Quebec.

In a report prepared for the Economic Council of Canada in 1982, Dr. J.C. Gilson identified the causes of this re-location:

> "Several factors may be cited as the reasons for this regional shift in hog production during the past decade: the statutory grain rates in Western Canada and the Feed Freight Assistance program have favoured the transportation of grain over livestock and meat products from the Prairie Provinces; the relatively high grain prices and appreciation of land values which favoured grain over hog production in Western Canada; the spectacular increase in integration and contract production in the hog industry in Quebec." [7, p.8]

To this may be added the Quebec government's desire for increased self-sufficiency and its support programs for the industry. The pork processing industry has, naturally, followed the shift in animal production from west to east. Thus, while the hog industry in Western Canada experienced considerable local market growth, there was a loss of the traditional market in Central Canada. The contribution of the pork industry to western growth has been considerably less than it could have been if its competitive position could had been maintained. If, given an optimistic scenario, the same percentage of

national hog slaughter as existed in 1962 had been retained in the west, it would have meant an extra 2,138,000 hogs slaughtered in Western Canada in 1982. At an average of 169 lbs per hog and $80.00 per cwt., this would have meant an additional $289,057,600 in hog sales.

Gilson estimates:

> "For every $100 of additional demand generated for hogs there is a combined gross increase of $178 in the output of all industries providing inputs to hog production; for every $100 of additional demand created for red meats there os a combined gross increase of $235 in the output of all industries providing inputs to the production of red meats." [7, p.11]

Given this, the magnitude of the possible loss for Western Canada due to the eastward shift in production becomes evident. The apparent erosion of the competitive position for beef, and especially pork, over the last two decades has led to considerably less growth than may have been possible.

Three major government policies can be identified as having affected the lessening of the competitive position of western livestock and livestock products in eastern markets: the statutory Crow's Nest Pass Rate; the Feed Freight Assistance subsidy and the policies of the Quebec government to increase self-sufficiency. The long standing transportation policies became critically important only with the advent of sustained inflation.

(1) Feed Freight Assistance

In January, 1941, the Feed Freight Assistance policy was initiated to encourage the nation-wide production of livestock as part of the war effort. In an eastward direction, it provided a subsidy on the movement of grains from Thunder Bay to points in Central and Eastern Canada. The amount of the subsidy increased with distance. When the war ended, the subsidy remained. To remove it would have meant that farmers who had adjusted their operations in response to the subsidy, would have had a further and costly

re-adjustment. In 1966, the subsidy was reformalized with the passage of the Livestock Feed Assistance Act. It was to ensure "fair equalization of feed grain prices in Eastern Canada and British Columbia" [8, p.42]. The policy was to pay most of the cost of transportation from Thunder Bay to Central and Eastern Canada. As can be seen in Table 8, by 1975-76, the amount of the subsidy averaged approximately $8.02/tonne to Quebec and movements had reached 1,159,000 tonnes.

At the same time livestock and livestock products moved at full unsubsidized rates which were increasing with inflation. The Feed Freight Assistance subsidy was, at least partially, adjusted for inflation in its initial years. For Ontario and Quebec, the unsubsidized handling and transportation costs ranged from $13 to $17 per tonne. In 1974, a report by the Canadian Transportation Commission [9] estimated that it cost $3.55 to move the 800 lbs of grain (required to feed a hog to slaughter) from Winnipeg to Montreal. The cost to move 160 lbs (slaughter carcass weight of a hog) of fresh or frozen pork the same distance was $3.71. This gave a cost disadvantage of 5% for meat products. The same commission found no such disadvantage for the beef industry. The cost advantage of beef over grain was clearly reduced due to the policy. Expansion of packing facilities was going on in Central Canada and pork shipments out of Western Canada were declining. There was considerable unhappiness on the part of eastern grain producers and western livestock producers. As a result, effective August 1, 1976, payments were lowered considerably for parts of Ontario and Quebec (see Table 8). For many areas of Ontario the movement of subsidized grain ceased altogether. The value of the subsidy on grain moving to Quebec was substantially reduced. At the same time, however, a large number of grain storage subsidies were instigated. In 1980, these subsidies equaled $1,017,363 [10]. This, in part, offset the reduction in the grain transportation subsidy. By 1980, the subsidy on grain movements east was equal to approximately 33% of the total cost of shipping feed grains from Thunder Bay east [10, p.7].

Although generally welcome, the reduction in the Feed Freight Assistance payments came at a time when inflationary pressures increased the cost of transporting livestock products. Between 1974 and 1983 the cost of moving meat increased almost 260% (see Table 9). A quick update of the Canadian Transport Commission's calculations can be accomplished by inflating the 1974 cost of pork movement to 1980, assuming the same rate increase has been experienced for the movement of pork as with beef. According to Table 9, rates were 86% higher on February 1, 1980 than on December 31, 1974. Thus, the cost of $3.71, in 1974, for moving the equivalent of one hog, would become $6.90. According to the Canadian Livestock Feed Board [10], the cost of moving sufficient barley from Thunder Bay to Montreal by boat to feed out a hog would be $3.54. To this must be added the cost of moving barley from the prairies at the statutory Crow's Nest Pass Rate. This is approximately $1.81 (adapted from [12]) giving a total cost of movement of $5.35. This indicated a cost disadvantage for meat movement of 29%. Thus, the change in the feed grain subsidy was not able to offset the declining position of the livestock industry due to large increases in rail rates. This, however, is related to the Crow's Nest Pass Rate rather than the Feed Freight Assistance Policy. Basically, as a result of inflation, the reduction in the Feed Freight Assistance subsidy could not offset the declining percentage of real grain transportation costs represented by the Crow's Nest Pass Rate. Thus, as the eastward movement of pork had almost ceased, the western pork industry did not receive a significant benefit from the reduction of the subsidy.

(2) Statutory Freight Rates on Grain

In 1897, the Crow's Nest Pass Agreement between the C.P.R. and the Government of Canada was signed. This effectively established the basis for freight rates applying to, among other things, the movement of grain from the prairies to Thunder Bay. In 1926, the rates were made statutory and extended to the C.N.R. The rates were to be

fixed "forever" with no provision made for indexing or revision due to inflation. They are about $4.80/tonne for eastward movement. Until the mid 1950's, before (sustained) inflation, these rates allowed the railways a profit. In 1958, the MacPherson Royal Commission [12] found that the rates covered about 90% of variable costs. By 1977, the rates covered about 30% of cost [11] and in the early 1980's, this percentage had fallen to about 25%. With moderate inflation in rail rates (8-10%) by the end of the decade, the percentage would decline to 13% or 10% of cost.

As the rates apply to barley, this provided a considerable benefit to eastern pork feeders. The effect on the pork industry was to help maintain the relative pork-grain disadvantage for transportation to Eastern Canada. It also prevented, in part, any reversal of the trend to eastern production which could have arisen from the reduction in the Feed Freight Assistance Policy. The effect of the Crow's Nest Pass Rate on the beef industry was considerably less than for the pork industry because very few of the feeders moving to the eastern market are fed on western grown grain. Most are fed corn or forages produced in local areas. In fact, the cattle industry may have even benefited from the havoc created in the rail transportation system as a result of the inadequate compensation provided to the railways. The railways refused to make the necessary investments to upgrade or maintain their trackage and to purchase new rolling stock. As a result, the record grain exports of 1972-73 have not been equalled in subsequent years as sufficient grain could not be moved. The result has been considerable "shut-in grain" which is fed to cattle and marketed in the form of beef. The western cattle industry, however, lobbied hard for abandonment of the Crow Rate as they believed that eventually the rate would lead to a reversal of their positive meat-grain position. This implies a movement of the cattle feeding industry out of the region. Of course, in late 1983, significant changes to the Crow's Nest Pass Rates were passed in Parliament. The expected effects of these changes will be discussed in Section III.

(3) Self-Sufficiency in Quebec

It should be made clear at the outset that the goal of self-sufficiency or increasing the degree of self-sufficiency is not a goal unique to the province of Quebec. Most provinces express such goals and have in place policies which promote such goals for a number of commodities, including livestock. Quebec has been singled out here for two reasons: (1) the historical importance of the Quebec market for western livestock products; and (2) the effectiveness of Quebec programs. As Ontario is largely self-sufficient in the production of livestock products, the majority of western livestock products have been marketed in Quebec. Thus policies of the Quebec government to increase self-sufficiency have a larger potential impact on western markets. In pork especially, Quebec is "viewed as 'aggressive' or as having 'gotten good mileage' out of its programs through initiative in, and cooperation between, the government and the agricultural sectors" [5, p.38].

Programs in Quebec have concentrated on encouraging a modern, efficient and vertically integrated hog production and marketing system. A farmer cooperative, Coop Federee is fully integrated into the hog feed, hog production and hog marketing sectors. Compared to two decades ago, when hog production in Quebec was largely fragmented,

> "The so-called 'integrators' supply about 80 percent of the market hogs and control 50 percent of the breeding stock... The single largest independent operator in the province owns 20,000 sows and markets 300,000 pigs per year. On the commercial side, feed mills control a significant portion of the production, using the pigs as a vehicle to market feed grains. The powerful Co-operative Federee du Quebec alone controls 30 percent of the province's sows, either directly or indirectly through contract arrangements with independent farmers." [13]

This "revolution" in the Quebec hog industry was accomplished with the encouragement and financial aid of the provincial government. The resulting economies of scale, combined with low-cost western grain, led to a rapid expansion of the industry. Currently, Quebec is self-sufficient in production and is moving product into the

Maritimes. At times, concern has been expressed over possible movement of Quebec pork into Manitoba. Thus, the expansion of the pork processing industry, combined with construction of modern pork processing plants in Quebec, have led to a large industry "in being". Now that this is accomplished, it seems unlikely that the Quebec government would allow the industry to contract, even if removal of Feed Freight Assistance and complete abandonment of the Crow's Nest Pass Rate were possible. Hence, it would seem the eastern pork market is lost permanently for western producers.

The Quebec government seems interested in repeating its pork industry success with the beef cattle industry. Stabilization programs for cow-calf operators and feedlots, interest subsidies for improved breeding stock and a wintering bonus for cows bred to purebred bulls, etc. have been initiated. Quebec support prices are the highest in Canada. Only about 20% of total beef consumption now comes from local sources and the government would like to see this increase. The process of attracting a larger beef industry, however, has proved very expensive and the cash short provincial government may not be able to improve the position of the industry. Again, however, the Quebec government is unlikely to allow the industry to shrink, thus limiting any increase in shipments of western cattle to Quebec markets.

In general, then, over the past two decades, the traditional outlet for surplus western livestock products has not provided an avenue for growth. In the hog industry, there has been an obvious decline in the value of the eastern market to the economy of the west. It would appear that the cattle industry has approximately held its own, but there has been little growth in its contribution to the western economy. Certainly the mix of products has changed but the net effect of this is not clear.

C. The Export Market

The export market for Western Canadian livestock and livestock products can generally be divided into three markets - the United States, Japan and the rest of the

world. Except for relatively minor exceptions, the only markets which could be termed developed are those with Japan and the United States. Sales to other nations tend to be either "one shot" or based on individual contracts. Little, if any, promotion or systematic exploration of these markets has been conducted. Over the last few years considerable effort has been put into the Japanese market but, as yet, its potential has not been fully exploited. The American market is traditional, and movements of cattle across the U.S. border have been going on since the early settlement of Western Canada and the days when cattle were trailed to market.

There is, however, one common characteristic of all three markets. They tend to be very unstable, week to week, month to month and year to year. Trade in livestock and livestock products tends to be extremely dependent upon short term market forces rather than consistent customer-seller relationships which stress security of supply. There are a number of reasons for this. The meat processing industry is, on a daily basis, extremely competitive, with low margins and competitive bidding. A change of a cent per pound can make or break the weekly profitability position of a packing plant.

Stable international trade tends to require longer planning horizons than the industry is able to provide. With such small margins, changes in the exchange rate over the shipping period can make an intially lucrative trade agreement unprofitable. As there is little vertical integration in the industry, any packer will have a maximum local price for livestock that ensures profitability. If the domestic market is momentarily strong, he will be unable to secure livestock at this price. As the products are relatively perishable, it is seldom possible to use storage to overcome such problems. Refrigerated storage, if technically feasible, is usually quite expensive. Buyers are equally reluctant to become locked into long-term contracts in a world where national industries are unstable and alternate sources of supply are generally available. Clearly, however, the more specialized and processed the product, the more likely secure markets can be found.

The main effect of such instability for western growth is that it precludes investment in export oriented plant and equipment. Even if such markets are expanding, the risks associated with even short term market interruptions prevent specialization which would cater exclusively to the export market. The markets will now be examined in detail.

(1) The United States Market

For the cattle industry, the United States market presents the same range of opportunities for export as the eastern market. Feeder cattle, slaughter cattle, carcass beef and boxed beef products can be exported to the United States. Table 10 gives some indication of the mix of slaughter and feeder cattle which are exported to the United States. Unfortunately, exports by province are not available for earlier years. Even the changes betwen 1981 and 1982 give some indiciation of the volatility of the market. Table 11 presents data for processed meat products. Clearly, the composition of product mix will determine the value of the market to Western Canada. The more processed the product, the more value added remains in Canada.

In most years Canada is a net exporter of cattle and beef products. The average net trade balance with the U.S. for beef cattle between 1977-80 was $167 million. In the U.S., two regions account for most of Western Canada's beef exports. These are east north central states (Wisconsin, Indiana, Illinois, Ohio and Michigan) and the west north central states (Nebraska, Missouri, Kansas, Iowa, North Dakota, South Dakota and Minnesota). Most of these exports have been in carcass form.

The product with the most processing, frozen boneless beef, also went largely to the same regions. The volumes have fluctuated considerably from 8.1 million pounds in 1976, to 10.3 million pounds in 1978, to 5.2 million pounds in 1980. The market on the west coast (Washington, Oregon, Alaska, California and Hawaii) has shown an increasing

trend from 0.18 million pounds in 1976, to 1.2 million pounds in 1978, to 4.2 million pounds in 1980.

Fresh boneless beef has represented a small and declining portion of beef exports. The majority of exports to the U.S. are cow and bull beef and this represents low value items. Little progress has been made in the export of product for direct consumption (steaks, roasts, etc.).

The movements of feeder and slaughter cattle depend on a number of factors - relative grain costs between the two countries, exchange rates, and supplies of cattle in each country. The volume of feeder cattle moving to the U.S. is relatively small. In 1982, this amounted to approximately 82,000 head which is 14% of the volume usually shipped from west to east. Slaughter cattle, on the other hand, can represent a larger market, although it fluctuates considerably. In 1982, roughly 124,000 slaughter cattle moved south compared to only 78,000 moving east. Slaughter cattle represent the most convenient form of beef exports. The tariff on live cattle is relatively low and, once in the U.S., beef can be packed and graded according to American standards. Such product is packaged, labelled and graded as U.S. product and does not risk consumer resistance. Differences in Canadian grading standards, and the requirement of "nation of origin" labelling, on the other hand can present problems for slaughtered and processed product. The movement of slaughter animals, however, does represent some foregone value-added.

Movements of live hogs and sheep are relatively small. Slaughter hogs exported in 1982 represent only about 4% of western slaughter. Sheep movements, in the same year, represent only about 10% (see Tables 12 and 13). Canadian pork exports were approximately 284 million pounds in 1981 (imports were 44 million pounds). American imports from Canada were about 167 million pounds. Except for canned hams, western percentages of such imports have traditionally been low (see Table 11).

In general, the U.S. market is a growing one for Western Canada, but the large fluctuations in quantity and product mix have reduced its potential to add to western growth. Thus, due to the risks involved, specific investments have not been made to exploit this market. Consequently, it remains a market of opportunity, and of the moment, and not one upon which to base expectations of sustained growth.

(2) The Japanese Market

Between 1970 and 1980, Japan replaced the United States as Western Canada's largest recipient of pork exports. Since then, the two markets have been relatively equal except for a one-time increase in Canadian exports to Japan due to the recent outbreak of hoof and mouth disease in Denmark. Again, although the market is growing, fluctuations tend to be quite large and the Japanese have a conscious policy of not becoming reliant on any one supplier. In normal times, Canada, the United States and Denmark equally share parts of 75% of the Japanese market. In 1980, total Japanese imports were valued at U.S. $409 million and represented a volume of 108.2 million tonnes. Most of this was either fresh or frozen, rather than cured. Table 11 provides a breakdown of Canadian exports and western, as well as provincial, proportions of the trade.

In the early period of western expansion into the Japanese market, attempts were made to get away from the wildly fluctuating nature of the export market. The hog marketing agencies of the prairie provinces have endeavoured to secure longer term contractual arrangements. Initially there was some success. Japanese pork importers perceived that the volatility of the world pork market could be exploited. Therefore, for them, such contracts are risky. Clearly, they see no problem with security of supply.

Thus, after rapid growth in the 1970's, the exports to the Japanese hog market seem to have reached a mature stage. It is unlikely that Japan would allow Canada to become a dominant supplier. This does not mean, however, that the market is assured.

Canadian prices must remain competitive. Even so, continuance of the market is ever at the whim of the Japanese government, witness the de facto embargo on pork imports imposed by Japan in late 1979.

Imports of beef are severely restricted by the policies of the Japanese government. In 1980, Japan imported 121.9 thousand tonnes of beef with a value of U.S. $432 million. Australia has the largest share of this trade with about 75% of the total. The U.S. was second with about 20%, and New Zealand third with about 3%. Canada ranked fourth with less than one percent of the market. In 1982, Western Canadian exports of beef to Japan equalled 1,315 tonnes and was valued at $6.5 million. American exports to Japan were about 12,800 tonnes. It is generally recognized that Canadian product cannot compete with Australian prices for the mass market. Grass fed Australian beef is of a considerably lower quality than Canadian product. Given the nature of the Japanese market, which is beef starved, quality considerations are not important for mass consumption. American exports, by contrast, tend to be high-cost food service cuts. In general, for this trade, the Japanese have a preference for heavier, well marbled beef. As the American beef grading system's premium grades require a heavier and better marbled (fatter) animal than the Canadian system, U.S. exporters find it easier to comply with Japanese requests. A cattle producer in Canada who is attempting to produce for those grades which receive the highest premium, A1 and A2, will only produce the heavier cattle of Japanese preference by mistake. There is no organized production specifically for the Japanese market, although there are usually enough over-fat cattle to meet current requirements. Canadian processors are still at a learning stage in meeting the requirements of the Japanese trade and, as such, shipments go at some risk. Over time, this risk should be reduced. In general, the Japanese beef market is one of considerable potential. This will be discussed in detail in Part III.

(3) Other Markets

Western Canadian meat and meat products face considerable barriers to entry in other markets. Imports by the low income countries on the Pacific Rim are dominated by lower cost Australian products.

The protectionists policies of the E.E.C. and the closeness of Eastern Canada preclude any major shipments to that market. There has been some development in the market for breeding stock in various parts of the world. Although this has been of some benefit to the purebred industry, it represents a technology transfer which can only have limited benefit for the industry in the long run.

Whatever sales of meat products take place in markets other than the Japanese and the American, tend to be "one shot" deals which, while welcomed, are not particularly important for the industry. Little, or no, investigation or effort has been spent on these markets.

D. The Industry at the Beginning of the 1980's

The value of the primary livestock industry for the western economy can be seen in Table 14. The total value of farm cash receipts from the sale of livestock in 1981 was $2.741 billion and represented 26% of all farm cash receipts. It ranged in importance from 38% of receipts in Alberta, to 14% in Saskatchewan. The number of farms in each province receiving all, or part, of their income from livestock, is reported in Table 15.[3]

The statistics for the meat processing industry are presented in Table 16. The industry accounts for 12% of all industrial shipments in Manitoba, 14% in Saskatchewan, 16% in Alberta and 3% in British Columbia. The contribution to value added in manufacturing ranges from 1% - 8% of the provincial totals.

Table 17 reports the total value of the red meat and poultry processing industry for the years 1970-1980. The value grew steadily over the decade. Table 18 presents figures for employment in the slaughter and meat processing industry for the same decade. The

industry employs approximately 12,000 people in Western Canada, about a thousand more than a decade ago. The figures are slightly out of date and the industry has declined somewhat since 1980 as a result of the end of the boom in Alberta and the general recession. Still, meat processing ranks as the first manufacturing industry, by volume of sales, in Saskatchewan and Manitoba, and ranks second after petroleum refining in Alberta. In Alberta, it is the largest manufacturing employer. Taken as a whole, the livestock processing industry is the largest employer, has the largest payroll, is the leading sales industry, and is the major consumer of fuel and electricity.

Consequently, the development of the livestock industry has been extremely important for Western Canada. Since 1962, the cattle population has increased by 1.6 million head, beef slaughter by nearly a million head and hog slaughter by almost 800,000 animals. Chicken production has increased 158 million pounds. Value-added has increased two and a half times since 1970. With a total multiplier of about 5 [7], the impact of this growth has been considerable. Given its size, growth in the livestock industry will be a large determinant of the future development of the Western Canadian economy.

The growth of the industry brought considerable expansion of packing facilities between 1970 and 1980. There were 58 more slaughter and meat processing establishments in Western Canada in 1980 than there were in 1970 (see Table 19). Eastern Canada had a net increase of 36 plants. Older plants were also retained in production longer. These investments were made on the expectation of continued growth in the industry. In part, due to the recent recession, slaughter has decreased considerably. More important, however, is the decline in per capita consumption since about 1976. Total consumption has declined from 101.7 kg per capita to 98.7 kg in 1982. Especially hard hit is beef, which has decreased from 53.6 kg to 42.5 kg. Although there has been some closure of plants, large amounts of excess capacity will exist. Currently, in Alberta, for example, cattle slaughter facilities were running at about 26%

of capacity and hog plants at 30% capacity. These figures are based on a one shift per day basis. As a region, Western Canada's beef slaughter was less than 60% capacity in 1982 and hog slaughter was at about 38% of capacity.

This excess capacity also extends to the feeding industry. Although current problems may be aggravated by the phase of the cattle cycle, considerable excess capacity would exist in any case.

Thus, the industry enters the 1980's with large amounts of excess capacity and almost no growth. This is a considerable change for an industry which experienced over 20 years of fairly continuous growth. Table 20 suggests that the western industry's contribution to the total Canadian value-added may have declined since 1977.

III. PROSPECTS FOR FUTURE GROWTH - TRADITIONAL FORCES

In this section, the prospects for the future contribution of those factors which have traditionally influenced the growth of the livestock industry will be analyzed. As with any projection, some assumptions must be made about the nature of future events. Here, no radical changes are assumed. The future will be examined in the same manner as were the historical developments, with the focus being on the three likely markets for livestock products. In addition, the effect of possible changes in government policies will be examined.

A. The Local Market

The overwhelming current features of the local market are a slowdown in the rate of growth and considerable excess capacity. Thus, in the medium term, increased investment in the livestock industry seems unlikely. In the future, as the economy expands, the excess capacity must be utilized before there can be continued growth.

For the local market, three scenarios will be developed. The first assumes no growth in per capita levels of meat consumption from the 1981 level, i.e., consumption remains at 98.7 kg per capita. It also assumes that the mix among the meats remains constant, that is, beef and veal, 42.5 kg per capita (43%), pork at 31.5 kg per capita (32%) and poultry at 22.6 kg per capita (23%). Clearly, this notion suggests that no particular commodity will experience a more rapid rate of technological change than another. Also, it must be taken as a long run average, since, in the short run, with hog and beef cycles, the relative prices and relative percentages of consumption will be altered.

The scenario assumes a 2% annual population growth for the west. This allows for natural increase and some interregional migration east to west and net international migration at current rates. The results are reported in Table 21 as Scenario 1. Under this projection, population will be expected to reach 9.5 million in 1997. This would

require an additional 242.2 million kg of meat products or an increase of about 35% over current levels. Specifically, for beef it would mean an increase of 104.4 million kg. This translates into an additional 353,300 animals for slaughter. At current prices of $75 per cwt., this implies an initial increase in gross income of $278,000,000. If we use an approximate total multiplier of 5 [7], the total increase would be $1,390 million. It should be pointed out that the beef industry is considerably overbuilt. It has capacity to produce 334.8 million kg of beef (the 1976 high consumption levels of 53.6 kg per capita on a western population base of 2,466,600). In Scenario 1, these levels will not be reached until after 1987 (see Table 21). Thus, one can expect little or no investment in new primary beef facilities to be made until that date.

Domestic pork production would increase 77.3 million kg (1,062,000 million animals) or $135,936,000 at current prices. This represents a 35% increase over current levels.

As a percentage of total western slaughter, the additional animals represent an 18% increase in beef slaughter and an increase of 31% in hog slaughter. Given even a conservative estimate of 30% overcapacity in western slaughter facilities, there would be no need for any net investment in facilities until 1997. This assumes, of course, no change in the eastern or export market from current levels.

Although projections of increased population are subject to some disagreement, the major unknown in determining future levels of meat consumption is per capita consumption. As can be seen from Table 1, Canadian per capita consumption has declined over the last few years. It has also declined in the United States. In the past, meat and protein products in general have had high income elasticities. There was a steady increase in per capita consumption as incomes rose in Canada, from 75 kg per capita in 1962 to the high of 101.7 in 1976. This trend is also observed internationally (see Table 22). However, there may be a saturation point between 100 and 110 kg per capita depending on the country.

The decline in per capita consumption of meat in Canada has been attributed to a number of forces. The slowdown in the growth of real income may have caused some retrenching. Concern over the effects of cholesterol on health has led to reduced consumption by some segments of the population. The general trend toward fitness and less obesity is also likely to have contributed to the slowdown. Such changes in tastes are extremely difficult to predict. Some tend to regard them as "fads" while others believe they are fundamental changes in lifestyles. In deference to the former view, we have developed the other scenarios based on increased consumption per capita.

Scenario 2 (Table 21) assumes a 2% annual increase in population and a return to the 1976 aggregate per capita consumption of meat (101.7 kg). However, the relative percentage composition of this mix is assumed to be that present in 1981. For the primary beef industry, by 1997 there would be an increase in production of 39% over the 1982 level. (The total production levels would reach the 1976 level around 1987.) This represents an additional 394,985 animals for slaughter or a 20% increase over current slaughter levels. Obviously, the local market demand could not absorb the 30% in excess beef slaughter capacity by 1997. For the hog industry, Scenario 2 results in a 34% increase in production. As current excess capacity is about 30%, new investment in facilities will be required by the mid 1990's.

The third scenario (Table 21) allows the per capita consumption of meat to reach the 1981 U.S. level of 114.3 kg per capita by 1997. (The U.S. per capita consumption is the highest in the world.) This would lead to a 56% increase in cattle proudction over 1982 levels, implying a 28% increase in slaughter over current levels. Consequently, there need not be net investment in beef slaughter facilities if only the growth in the local market is considered. For hogs, there would be a 52% increase in slaughter. This scenario would necessitate investment in new hog processing facilities by 1992.

It is evident from each of these scenarios that even withn optimistic assumptions, expansion of the local market alone will not be enough to generate any significant growth

until the mid 1990's, if at all. Thus, it appears that the two external markets must provide the increase in demand that will generate growth in the Western Canadian livestock industry. It is to these markets that we must now turn.

B. The Eastern Market

In a recent study for the Canadian Institute for Economic Policy [5], it was found that barriers to interprovincial trade in agricultural commodities were increasing. Some of the main restrictions were identified as: (1) transportation related policies (Crow Rate and Feed Freight Assistance); (2) agricultural marketing boards (CCMA, CTMA); (3) government assistance with regional-provincial emphasis; (4) provincial food promotion progams; and (5) growing emphasis on provincial self-sufficiency [5, pp. 54-58]. All of these, more or less, apply to the trade in livestock commodities. As both levels of government have been active in the creation of such barriers to trade, it would seem unlikely that there will be any change in this trend.

The state of west-east trade at the beginning of the 1980's can be easily summed up. In poultry, interprovincial movements are restricted by the national commodity boards for broilers and turkeys. The eastern market for pork has almost disappeared. The cattle and beef market is relatively stable. The prospects for each of these products will be examined in turn.

(1) Poultry

As both the broiler and turkey industries come under the quota allocation systems of national marketing agencies, there would seem to be few prospects for west to east interprovincial movements in the future. If there continues to be a shift of population from east to west and given the problems of re-negotiating interprovincial quota allocations, there may be times when provinces who have declining population shares will attempt to retain quota and supply the growing western markets. This, however, should

not be of particular concern as the evidence suggests that these boards are primarily promoting provincial self-sufficiency. Therefore, it would seem that the western provinces will be self-sufficient over the foreseeable future. The eastern market, however, will not be available for western product and will provide for no additional growth for the sector. The provincial marketing boards have restricted supply, creating large price differences between the U.S. and Canadian poultry markets. Export markets will be unavailable because Canadian product cannot compete with U.S. product, either in the U.S. or the world market.

(2) Pork

As suggested earlier, the eastern market for western produced pork has all but disappeared over the last two decades. All the individuals contacted in the pork industry during the course of research for this report did not feel that the market could be re-captured. This seems to be a fair assessment. Even if, in the long run, the changes to the Crow legislation could reduce the advantage of feed over meat movement, it would still seem unlikely that this market could be regained. As Ontario is roughly self-sufficient and Quebec is currently in the position of being a net exporter, opportunities in these markets are not likely to exist. It does not seem reasonable that the Quebec government, after fostering self-sufficiency, is likely to allow a retreat from that position. However, given budget constraints, it seems unlikely that the Quebec government would subsidize the industry as a long term net exporter, so worries about Quebec product moving into western markets are probably unwarranted. In short, the eastern market is unlikely to provide an outlet for western product in the forseeable future and cannot be seen as contributing to western growth.

(3) Cattle and Beef Products

It would appear that the cattle and beef market is the only market with potential for growth in Eastern Canada. This growth is contingent on a number of factors, the majority of them government policies.

Any real potential for growth depends, to a large extent, on the policies of the Quebec government. At the moment there is a committment to an increasing degree of self-sufficiency, but whether western imports can be supplanted by home production is doubtful. As the Quebec market continues to grow, production from Quebec may be able to satisfy the incremental demand. This would, in effect, preclude expansion of the western market.

The mix of production moving east might be altered, leading to change in value-added for western industry. At the moment, the Quebec government is attempting to encourage the entire Quebec industry, from cow-calf operations to processing. The establishment of a cow-calf industry traditionally has required an extensive native grass, pasture and/or forage system. The land base in Quebec is relatively small and expansion for cow-calf operations relatively expensive. Cattle feeding, on the other hand, is much less land intensive. As long as the movement of grain is subsidized, it may be possible to encourage the establishment of a feeder industry at considerably less cost. The cash-short Quebec government may wish to concentrate on this aspect of the industry. This would create an increased market for western calves. Clearly, this is the greatest advantage the western livestock industry has. The grass resource cannot be exported in any other form than animals, but the exportation of feeder calves represents the smallest possible value added for the region.

Western governments have constantly worried about the "hewer of wood" and "drawer of water" nature of their economies. The export of calves is seen as falling within this category. Of late, programs in Saskatchewan and Manitoba have been initiated to discourage the export of calves. These "stabilization" programs encourage

retained ownership of calves to slaughter weight. The program appears relatively successful in Saskatchewan, the traditional source of calves for west-east shipments. In addition, the considerable excess capacity in western feedlots has led to a very competitive market for calves and eastern buyers have found product harder to obtain. Thus, although there may be some increase in demand for calves in Quebec, they may no longer be readily available. Of course, alternative supplies are obtainable from the United States. Western provincial governments may find their industries in a double loss situation with beef markets in Eastern Canada supplied by increasing amounts of eastern finished beef, and the feeder industry supplied by U.S. calves rather than by western calves. The relative strengths of these various forces will depend on the political wills and financial contribution of the various provincial governments.

In terms of change in product mix, there appears one area where increased value-added appears likely. This is the movement of "boxed" beef, rather than carcasses. Currently, about 11,800 carcasses move to Eastern Canada each week. Over time, more and more beef has moved east in "boxed" form. The only major resistance to this changeover is the Montreal market. Any movement to boxed beef from the west means a reduction in eastern value-added, and, not surprisingly, has been opposed. At best, this is likely a delaying action, as there is considerable increased efficiency in the central boxing of carcasses compared to the traditional carcass butchering on retail premises.

If, over time, boxed beef shipments were to completely replace shipments of carcasses, considerable value added would accrue to the west. Boxing beef adds about 10 ¢ per lb to value added [14]. The addition to value added for current shipments would be approximately $40 million (11,800 carcasses x 650 lbs per carcass x 0.10 x 52 weeks).

The various cattlemen's organizations in Western Canada were major lobbyists for changes to the Crow Rate. As suggested above, they feared that their industry would follow the hog industry east because of the worsening terms of trade created by the

growing "Crow Gap". Cattlemen hoped the rate would be abandoned, causing the relative price of grain landed in Eastern Canada to rise. The legislation eventually passed is likely to have substantially different effects than those desired. In the short run, the burden of the "Crow Gap" has been transferred from the users of other goods transported by railways to the Canadian taxpayer and the landed price of grain in Eastern Canada is unlikely to change. Over the long run, if the current formula is retained, western grain farmers will have to pay some additional costs of grain transportation. The real benefit expected from the abandonment of the rate was to be increased "shut-in" grain. That is, if the delivered cost of feed grain to Eastern Canada was increased, demand would decline, leading to larger supplies in Western Canada. The western cattle industry could take advantage of the resulting fall in price. The outcome of the current legislation will be just the opposite to the above expectations for two reasons. First, as already stated, the landed price of grain in Central Canada is unlikely to change significantly in the near future. Secondly, all payments are to go to the railway, rather than directly to the farmer. Consequently, the only way the railway can receive a subsidy is by moving grain. If the railways begin to aggressively move grain, then considerable amounts of currently "shut-in" grain will be transported to Thunder Bay or west coast ports, thus increasing the price of grain in the prairie region. Certainly there is no lack of export demand. Such increased prices for feed grain would be detrimental to the western livestock industry. The increased movement of grain will not be manifest in the short run as it will take the railways considerable time to make the necessary investments in the rail beds and rolling stock.

As the whole question of the Crow Rate must be re-negotiated after 1986, there is considerable uncertainty about the future. In general, the concerns of those involved in the industry are that the changes to the Crow Rate will be too slow to help the industry before the end of the 1980's. Beyond that, the effect is unclear. In general, changes to

the Crow Rate are not expected to have a positive effect on the western livestock industry and its contribution to western growth.

There is another transportation problem that could affect Western Canada's ability to export product. Cattle cars are used to ship livestock to the eastern market. Most of these cars are old. When large numbers of slaughter animals were moved to Central Canada, these cars were kept in relatively constant service. As movements of slaughter cattle are reduced, the cars are primarily used to move feeders. Most of these are moved in the fall. Therefore, the cars are only used for a few trips per year. The railways are naturally reluctant to spend large sums to maintain these cars, much less to purchase any new equipment. Consequently, the stock is continuously being reduced as cars wear out. At present, cattle are being hauled east largely by trucks which are readily available in the west because of the recession. As the economy generally improves or as fuel prices rise, trucking cattle may become more expensive, causing a shortage of inexpensive transport for the movement of feeder cattle.

One further policy must be discussed. A faction of the beef cattle industry advocates the institution of a supply management scheme for their industry. (This concept has the support of the federal Minister of Agriculture.) Supply management in the cattle industry would have a number of effects. The reduction of supply and subsequent increase in price would mean the loss of the beef export market to the United States. A decline in the domestic market due to lower priced U.S. imports could only be prevented through strict import quotas. It has been suggested that the size of the herd would have to be reduced as much as 52% to achieve a target price that would cover costs of production [15]. If the more conservative figure of 30% is used, there would still be disastrous effects on the western livestock industry. In order to reduce the cattle herd, an increase in slaughter of cows and heifers would be required. In the short run, this would mean a significant reduction in beef prices. In the long run, although the incomes of cattlemen might be increased to some extent, the feeding, packing and

processing industry would be in a position of even more excess capacity. Through the multiplier, this could mean a large reduction in value-added, employment and general economic activity. Needless to say, there would no need for increased investment in the industry for the foreseeable future. The implementation of a supply management marketing board for beef would be detrimental to the growth of Western Canada.

In general, the eastern market does not appear to be an avenue for increased growth of the Western Canadian livestock industry. There may be some marginal improvement to the total value of the industry, primarily due to alterations in the mix of products sent to Eastern Canada. Expansion of the total market is unlikely, however, and definitely subject to considerable uncertainty.

C. The Export Market

Two major export markets will be examined in detail as they would seem to provide the most likely avenues for market growth. These are the Japanese and the United States markets. It is assumed that low-price Australian beef will continue to dominate the markets in the lower income countries of the Pacific Rim. It is further assumed that the current tariff policies of the E.E.C. will continue and that Eastern Canada will retain its advantage vis-a-vis the European market. The efforts and energies of the Western Canadian livestock industries are currently concentrated on U.S. and Japanese markets as there is a general feeling in the industry that the Eastern Canadian market is either lost or not one which can be counted on for growth. Therefore, there is a great interest in expanding into either the U.S. or Japanese markets as they provide the only real avenues for growth.

International trade in agricultural commodities is much more complicated than inter-regional trade. For many in the meat business in Western Canada, the markets generally represent an unknown. The process of expansion into new areas is at the initial stage of identifying contacts and major actors in the industry. There is a cognizance of

the political difficulties involved but a lack of experience in dealing or reacting to them. There is, however, generally a positive attitude on the part of the processors, industry officials and government personnel to pursue the development of these markets.

(1) The United States Market

The United States market for hogs and pork products is perceived as relatively mature. New market areas could not be identified so any growth will likely come from further exploitation of existing markets. Domestic American production has grown more competitive over the last few years, implying a reduction in the Canadian competitive position. As a result shipments to the U.S. have been fluctuating.

Problems for Canadian exporters stem from two major sources - technological change and labour costs. New technology in pork slaughter and processing is tied to economies of scale. Plant throughput has grown substantially in the U.S. One hundred and one plants, which comprise 8% of the total, slaughter 90% of all hogs. These plants have an average kill of 750,000 hogs per year. Many of the new plants are considerably larger. There were 34 plants in 1982 that slaughtered more than one million hogs (averaging 1.4 million hogs each). Almost 60% of all hogs were killed in these 34 plants. In Alberta, by contrast, the average kill per plant is about 375,000 hogs per year [16]. The under-utilization of Western Canadian plants adds considerably to unit cost and reduces the competitive position of the packing industry. The existing excess capacity and low rates of return make investments in new, larger and more efficient plants by Canadian packers unlikely. Thus, the disadvantages which arise from using less efficient technology will remain.

To further compound problems, labour costs in Canada have recently become considerably higher than in the U.S. This is not so much due to increases in Canadian wages as due to a large, one time, reduction in U.S. wages. A large financially troubled American hog slaughter facility was able to take advantage of U.S. regulations which

allow a type of bankruptcy and the subsequent re-negotiation of labour contracts. Wages were negotiated downward from $10.69 per hour to $6.50. Much of the U.S. industry followed suit. Wage reductions have not taken place in Western Canada. For some products, a $4.00 reduction in wages would result in over a $5.00 per cwt. change in supply price [16]. Therefore, Canadian plants are currently suffering from considerable wage differentials relative to their American counterparts. Under these conditions, exports to the U.S. are unlikely to grow. Furthermore, this may affect Western Canada's competitive position with U.S. product in the offshore market. The problem of wage differentials also extends to the beef industry. Until these problems are solved the growth of the export market for pork to the U.S. will be severely restricted. The problem of labour costs may be of a relatively short duration, the problems of technology will take considerably longer to solve. With considerable excess capacity available to service the domestic market over the rest of the decade, new investment in plant and equipment seems unlikely, unless there is significant growth in the Japanese market.

Even though the problem of wage differentials extends to the beef industry, there appears to be considerably larger potential for growth into the U.S. market. This expansion, however, may be fraught with pitfalls. Two major factors suggest that a reasonably large potential market exists: (1) relative transportation rates, and (2) a beef deficiency on the west coasts, particularly California.

The comparison of transportation costs out of Western Canada to various regions is interesting. Some comparative movement costs (including freight, brokerage and duty) in Canadian dollars are: Calgary to Montreal $11.99 per cwt., Calgary to San Francisco (based on 30% backhaul) $8.83 per cwt., Omaha to San Francisco $9.10 per cwt., In 1981, transportation costs (30% backhaul) were estimated to be cheaper from Edmonton to Seattle, Portland, Boise and San Francisco than from Omaha. Transportation costs from Edmonton or Omaha to Los Angelos are approximately equal. There is considerable

backhaul potential available to California due to the large northward movement of vegetables.

To put the California market in perspective, in 1979 the total California beef requirement was 3.4 billion pounds. Of this, 1.9 billion pounds had to be imported. Total Canadian production in 1979 was 2.02 billion pounds. The total production of Alberta, the most likely supplier of California, was 850 million pounds. If 10% of the California deficit could be supplied by Alberta producers, this would mean a 22% increase in Alberta production. The California deficit has been growing as a result of higher freight rates on the movement of grain into the state and diminishing supplies of water that are generally applied to high value vegetable crops, rather than forages. Part of the California deficit is supplied by Colorado, Arizona and Wyoming which are closer to the market than Omaha or Edmonton. However, the deficit is so large, supplies must also be drawn from points further away than Omaha. Alberta, at least, should still have a considerable cost advantage for this proportion of the California deficiency. As much of this deficit is relatively new, there are less established channels of trade and historic marketing relationships. Exports of Canadian beef to the California market will, however, be determined by regulatory or political forces. Much of the above discussion also relates to Washington and Oregon, which are also beef deficient areas.

The supplying of the West Coast market can be in many forms, of course, and each of these could be expected to affect value-added. For a number of reasons, the shipment of live cattle would be the simplest form of export, but has the lowest value-added. While tariffs are low on live animals, the most important advantage in the movement of live animals lies in the fact that it will meet little resistance in the U.S. market. Barring any effect on overall quota allocations, once moved to the U.S., Canadian raised beef becomes American beef upon slaughter and is treated as such in the U.S. market. Canadian beef slaughtered in Idaho or Washington cannot be differentiated from American grown beef when it gets to California.

Carcass beef, on the other hand, must be labelled as Canadian product. The tariff on beef is 2 cents per pound. Canadian carcass product may experience some resistance since it can be readily identified as such by U.S. final customers. The restaurant trade and some retail outlets often have expended considerable resources promoting the fact that they serve "U.S. beef". Canadian product would not be acceptable to such sellers and Canadian labelled product might also meet with some consumer resistance. More importantly, considerable pressure by lobby groups would likely be brought to bear if large amounts of visible Canadian beef were available in the market. Substantial non-tariff barriers can be used if the American government is pressured to slow beef movements. For example, both inspection at the border and American inspection of Canadian plants could be strictly enforced.

One advantage for Canadians is the dated U.S. grading system produces a fatter animal than consumers desire. This is especially true of California consumers with their concern for health. The result has been that less and less beef is graded by U.S. federal standards; rather it is subject either to "house grading" by packers or retailers or no grading at all. The Canadian grading system produces leaner carcasses that are well suited for the U.S. trade. Trial marketings of the product have been quite successful. Since most Canadian carcasses would not fit the specifications of the top U.S. grade, the movement away from grading is a benefit to Canada.

The movement of boxed beef to the U.S. is more complicated. At the moment there is a surplus of such capacity in the U.S.. Many of the large retailers have integrated backwards and have their own boxing facilities. Therefore, the demand is for carcass beef. Development of the boxed market probably requires more "on the premises" marketing than Canadians have been willing to undertake as yet. Therefore, major access to the U.S. market is likely to come from either live animals or carcass trade. The relative mix of these will be determined by the ability of the carcass beef trade to identify the part of the California market that can be entered with the least

resistance. It should be emphasized again that gaining access to only a small percentage of the California market deficit will lead to considerable expansion in Western Canada, especially Alberta.

(2) The Japanese Market

The most obvious feature of the Japanese market is potential. Consumption of meat in Japan is far below any other country with similar levels of national income per capita. A quick glance at Table 22 suggests that Japanese per capita consumption levels are somewhere between those of Turkey and Portugal, even though these countries have incomes about 1/8 or 1/4 that of Japan's. Japanese per capita consumption is only 30% of consumption in Australia and France, countries with incomes similar to Japan's. Although some of this lower consumption may be attributed to cultural differences, the existence of extremely high tariffs, the obvious preference for meat dishes by Japanese visitors to Canada, and the lucrative trade in tourist ready meat at west coast airports suggests there is also pent up demand.

There are several reasons for Japanese "protectionist" policies. The ruling party support is agricultural based and protection for farmers is a popular issue with the voters. "Food Power" is another major concern. As Japan is dependent upon a large percentage of food imports a measure of self-sufficiency is desired. However, grain must be imported to feed a large proportion of the animals produced in Japan, so food security cannot be the primary reason for discriminating against meat imports. While alternate sources of grain supplies may currently be more varied than sources for meat, this may only be a problem of administration. If the Japanese wished to reduce dependence on any one market, individual quotas could be issued for a large number of suppliers. Even with a substantial reduction of the Japanese tariffs almost any country in the world could supply beef at Japanese domestic prices.

Indirect food security could be a far more serious consideration and lies at the very

Exports of finished goods has been the mainstay of this policy. Much of the foreign exchange generated must be used to purchase the raw materials which are necessary inputs to the export industries. There is a realization that food must be imported. Meat, however, is the most expensive of the major food groups. If Japanese consumers were allowed to acquire tastes and consumption habits similar to western countries, a great deal of foreign exchange would literally be "eaten up" and, therefore, would not be available for imports of raw materials. Further, the Japanese have a first hand experience with the difficulty of changing food consumption tastes once established. In the turmoil that followed World War II, food shortages were relatively common and the American administration used its military facilities to distribute white bread. Many Japanese acquired the taste, forcing the government to import larger quantities of wheat rather than less expensive rice. If the same type of taste change were to happen with meat, the Japanese government might, in future, find it difficult in both a political and economic sense to reduce imports to save valuable foreign exchange. It is probably safer to restrict consumption ex ante rather than ex post. The question remains, however, of how long consumption can be restrained. This is especially true given American resolve to force the Japanese to liberalize trade restrictions on beef.

It should be remembered that the size of the Japanese market makes even small adjustments in consumption very important for potential exporters. With a population of 117,000,000 people, a one kg increase in consumption per capita translates into 396,000 beef carcasses (20% of Western Canadian slaughter) or 1,608,750 hogs (47% of Western Canadian production).

The general tariff on beef is about 25% and on pork 6.9%. There are, in addition, quotas on beef imports. Japanese importers have very specific requirements and more often than not, minor discrepancies lead to heavy penalties or rejection of product. Attention to detail may be as important as price in the acquisition of an order. As

Canada has no long or continuous tradition of supplying beef, and to a lesser extent pork, we have not been able to exploit Japanese concern over continuity of supply.

One further problem is that Japanese tastes in beef and pork run considerably fatter than Canadian tastes. Large increases in exports would require re-orientation of production towards product specifically geared to Japanese preference. No longer could shipments be made up of product which was available only because it did not meet the standards for Canadian top grades. Still, Canadians have had some success in exporting to the Japanese and there is no reason why this should not improve with time. It is largely a process of "learning by doing".

Some modest projections of the future impact of the Japanese market will now be made. The Japanese export scenarios will build upon the conservative Scenario 1 case for local market increases - that is, current levels of consumption and a 2% annual population growth.

For both Japanese export scenarios, it is assumed that the Japanese population remains constant at 117 million. Although, this is somewhat unrealistic, the growth rate in Japanese population has declined considerably in recent years. In any case, the projection will be on the conservative side. It is also assumed for both scenarios that Japanese per capita consumption of meat will be allowed to rise by 10 kg by 1997, from 32.6 to 42.6 kg. This would still leave Japanese consumption well below that of countries with equivalent incomes. This, again, is a conservative figure. It is further assumed that this increase is split evenly between beef and pork, at 5 kg for each commodity, and that all Japanese increases in consumption are made up from imports.

For "Japanese Export Scenario 1" it is assumed that Canadian beef will maintain the 1% market share it has now. Therefore, it will receive 1% of the expected growth. This is the conservative lower bound scheme. As pork is a mature market, it is assumed that Canada will retain about 20% of the total market and thus share in the same 20% total market growth. This is assumed because it is expected the Japanese government

will retain its policy of not relying on one supplier, preferring to have a number of suppliers. The results of Scenario 1 are presented in Table 23.

By 1997, the increase in both local and Japanese markets would lead to an increase in demand of 110.2 million kg of beef or 373,000 carcasses. This represents a 19% increase over the 1982 annual slaughter of 2,005,000 (see Table 2). Thus, if we assume 30% overcapacity at present, no new investment in plant and equipment would be required. For pork, local consumption increases plus additional Japanese exports would lead to an increase in demand for pork of 194.3 million pounds or 2,671,000 additional hogs per year. This represents a 77% increase above current slaughter and would require considerable additional investment in plant and equipment. If 30% excess capacity is assumed, this scenario would suggest that capacity would be fully utilized shortly after 1987.

"Japanese Export Scenario 2" presents the most optimistic case for beef. It is assumed that Canadian product will still not be competitive with Australian product. Thus, 80% of the increase will go to this supplier. At present, Canadian product competes with American product for the high quality trade - about 20% of the market. Scenario 2 assumes that all of the increase in this 20% of the market will accrue to Canada. This would represent an upper bound on possible Canadian exports. Under this scheme, an additional 221.9 million kg of beef would be required by the local and Japanese markets together. That would require an additional 750,000 animals and would represent a 37% increase over 1982 slaughter. This would necessitate considerable investment in plant and equipment. With this plan, given a 30% excess capacity, new investment in facilities would be required by about 1992. The pork assumptions and projections are the same as in "Japanese Export Scenario 1".

These two scenarios represent the probable upper and lower bounds for Canadian exports to Japan. It seems likely that we could better our past performance (Japanese Export Scenario 1) as we gain experience from "learning by doing". It seems unlikely that

we would be able to cut the Americans completely out of the incremental market as assumed in Scenario 2. The eventual result will probably lie in between. With a multiplier of about 5, the effects on the western economy can be appreciated in either case.

IV. NEW FORCES AFFECTING THE LIVESTOCK INDUSTRY

It has been assumed throughout this paper that resources do not constitute a constraint to increasing livestock production. There is ample grain producing capacity to feed any realistic number of livestock. The alternative mix of production depends on the relative prices of grains produced for human consumption, feed grains and livestock. There is one additional factor which may lead to some expansion of the cow herd in the foreseeable future. Due to the deteriorating condition of prairie soils in some areas it may become necessary to replace grain production with forage production. As this can only be marketed through animals, there may be some expansion of calf production. How significant this trend may be is not, as yet, discernible.

Changing demographic trends may also have an effect on the amount of value added which will be generated by the industry. A recent U.S. study [17] reported that the percentage of one and two person families had increased from 17% in 1950 to 54% in 1980. Canada is experiencing similar trends. In addition, the percentage of women in the work force is continuing to rise. Smaller household units and households with two bread winners have less need, inclination or time to spend on food preparation. Furthermore, especially in Western Canada, they have little tradition of dealing with local butchers as they age of the household units tends to be younger. Thus, there are opportunities to provide products which have an additional processing component to make them more "table ready". As final preparation labour, which was traditionally done in the home, is transferred to the processing sector, additional value-added and jobs are created. In some cases, the incremental value-added for such products may be up to 20%.

New technologies are also becoming available which could increase efficiency and provide for the expansion of both the domestic and export market. For example, "warm skinning" of hogs may provide considerable energy savings and thus, reduced costs.

Better mechanical deboning techniques can result in considerable labour savings. "Re-formed" beef products may provide a low cost product which may be acceptable in lower income foreign markets and allow Canadian beef to be more competitive with Oceanic product. These are only a few examples. As should be expected, most of the technologies appear to be at the late processing stages which increase value-added. If these can be exploited for the export trade, a great deal of additional value would arise.

There appears to be a serious problem with developing Canada's export trade and the solution will require a new approach. Canadian production and trade in livestock products is conducted within a structure compatible with the domestic and traditional trading markets. The structure of the industry is, for want of a better term, "vertically segmented". There are markets operating, for example, between purebred breeders and cow-calf operators, cow-calf operators and backgrounders, backgrounders and feedlots, feedlots and packing plants, packing plants and processors. Each of these markets is active almost on a daily basis. Prices change with great volatility at all levels. This market structure presented few problems when trade was conducted largely either in live animals or carcasses. This was especially true when the only significant export market was the U.S. which had similar tastes as well as a similar market structure. Thus, product destined for either the domestic or foreign market could be treated as a common commodity. Livestock producers could supply a product without concern for the eventual market. Any differences in specification that did arise could be handled at the final stage of processing in the importing country.

Exporting product offshore or with a greater degree of value added presents problems for the current market structure. The Japanese trade, for example, requires an entirely different product than the Canadian market. Japanese tastes command, in both beef and pork, animals which are considerably fatter than those which Canadians prefer. In beef cattle, the animals needed for the Japanese trade do not meet the specifications of the Canadian grades which receive a price premium, A1 and A2. As the

feedlot operator sells into an auction or near-auction type system, he has no knowledge of what market, Canadian or Japanese, he is selling to. Thus, he will produce cattle that will meet the requirements that will secure the domestic premium. The packer who receives an order from the Japanese must rely on what are essentially "mistakes" by the cattle feeder to fill his orders. At present, there is no price mechanism to inform the producer that product for a Japanese order is required. It may be that the packer could personally contact a feedlot about its requirements in advance, but few feedlot operators would be willing to commit resources to producing such cattle when, over the interim period, domestic prices could improve, and his prior committment would lead to foregone profits. This problem can work its way back through the system. It may be that alternate breeds of cattle would be better suited to produce the fat animals for the Japanese market. Unfortunately, since feedlots do not know the market destination of their product, they will not buy such calves and thus, cow-calf operators will not produce them and purebred breeders will not develop these strains. Over time, specifications between the U.S. and Canada have also diverged so a similar problem arises.

Further, as export trades take somewhat longer to arrange, planning becomes virtually impossible for the packer. Accepting an export contract locks the seller into a specific price. If the domestic market price increases over the interval between acceptance of the order and the actual requirement of animals to fill the order, foreign contracts will be unprofitable for the packer. The possibility of unprofitable contracts implies that the importer cannot be guaranteed security of supply and therefore long term market development becomes very difficult.

The more processed the product is, the more exact the specifications become and, of course, longer lead time is required. Again, changing packer or processor supply prices based on domestic market conditions make the guarantee of a profitable foreign transaction very difficult. If Western Canada tries to expand both its export markets and the value-added component of those exports, these problems will become more prevalent.

Vertical integration of the industry, or that part of it which supplies the foreign market may generally reduce these problems. The firm could look at the profitability of a foreign sale in its entirety. The feeding component of the business could be assured a market for product produced specifically for the foreign market, while the processing operation could count on a price for inputs. All such transactions would only be internal accounting transactions, and not subject to open market forces. Clearly, this is in part a "chicken and egg" problem. Considerable risk is involved in getting firms to integrate for the purpose of supplying specialized product when no continuing markets yet exist. On the other hand, not integrating makes it very difficult to develop those markets.

There is some evidence that vertical integration can provide the means to success on the international market. The vertically integrated hog industry in Quebec has been raising heavier hogs for the Japanese market. In Western Canada, as mentioned above, the provincial beef stabilization programs in Saskatchewan and Manitoba are encouraging vertical integration in the producing sector. Some further integration might be explored. A common export agency might help overcome these problems. This might be a role for the newly established Canagrex.

V. CONCLUSIONS AND RECOMMENDATIONS

Currently the livestock and meat processing industry in Western Canada has two salient features: (1) excess capacity; and (2) considerable "shut-in" potential. As a result, the contribution of the livestock industry to western growth is likely to be quite limited in the near future. The excess capacity is, of course, a relatively short run phenomenon and can be expected to eventually disappear as a result of industry rationalization and growth in the economies of Western Canada. The "shut-in" potential may or may not be a long term problem for the western livestock industry. That depends on the ability of the industry to identify, develop and service new markets.

The excess capacity exists for a number of reasons. There was considerable expansion in response to growth, both in population and per capita consumption, through the 1960's and early 1970's. Since the mid-seventies, however, there has been a decline in per capita consumption. In the eighties, the petroleum boom ended in Alberta and there was a general decline in economic activity in all prairie provinces during the recession. With their relatively high income elasticities, livestock products have experienced further declines in demand. In addition, there has been a decline in the competitive position of western products moving to Central and Eastern Canada.

There is no resource constraint to the expansion of the Western Canadian livestock industry. Potential production is far in excess of current levels. The problem is finding markets. The "shut-in" potential arises for a number of reasons. Traditional outlets for product surplus to western needs have been Central and Eastern Canada. Increasing balkanization of Canadian agriculture, promoted by the policies of both the federal and provincial governments - marketing boards, national marketing agencies, subsidies to promote provincial self-sufficiency, regulations and subsidies in transportation - has led either to a decline of these traditional markets, or at least no opportunities to share in their growth. International trade in agricultural commodities, in general, has become

more difficult. The traditional U.S. market for exports is not likely to provide for any significant growth due to strong U.S. competition and differing product specification.

In general, while western product has not been totally excluded from traditional markets (except pork markets in Central Canada), it has not been able to share in this growth. With substantial increases in productivity this has led to "shut-in" potential. The only positive growth factor has been the Japanese market. There have been large increases in pork exports over the last decade and a half. Beef has not fared as well. The Japanese market is tightly controlled. In any case, the Japanese market has not been cultivated and trade is of a "hit and miss" nature rather than sustained.

There are two major potential markets for Western Canadian product. The California market would appear accessible to (at least) Alberta on economic criteria. The success in gaining access to that market will be determined by the ability of the industry to move product into the market without incurring the wrath of lobbyists for the American meat industry. For products with low value-added this may not be as much of a problem. Products with high value-added may incur more resistance.

The Japanese market exhibits pent up demand. Japanese government policies artificially restrict consumption through the use of quotas and high tariffs. Given the size of the Japanese population, even moderate levels of increased per capita consumption lead to considerable market opportunities.

As the market in Central and Eastern Canada is likely to remain closed, at least in a growth sense, any positive contribution to Western Canadian growth derived from the livestock industry will depend on successful expansion into the California and Japanese market. The California market will likely result in a lower value-added than the Japanese market given the ease of moving live animals to the U.S. As almost all product moving to Japan will have a higher value-added, the processing industry will have to internalize the use of more complicated technology and be more flexible and precise than ever in the past.

Projections based on different rates of growth in the local Western Canadian market, ceterus paribus, suggest that only in the most optimistic case would there be any growth beyond existing available capacity before at least 1992. If even moderate amounts of growth in the Japanese market can be accessed by Western Canada, then this market growth, combined with conservative local growth projections will lead to the need for large net investments in the late 1980's.

The most discouraging aspect of preparing this report was the apparent dearth of information, much less serious research, concerning the Japanese and U.S. West Coast markets. The work which has been done, while informative, was only of a broad nature, giving information on general magnitudes, the nature of regulations and identification of the industry structure. If the Western Canadian economy is to realize even part of the potential available from its livestock industry, considerable research must be done.

There are a number of areas that could be the subject of further study and research. It is suggested that:

(1) Product specific research be conducted for the California market. The focus should be to evaluate particular markets both from the economic and political aspect. The objective should be to identify products with the greatest value added and the least expected resistance.

(2) Considerable additional effort should be made by agents of the Canadian government, western provincial governments, product marketing agencies and, if possible, private industry, in establishing contracts and becoming familiar with the Japanese industry. A special effort should be made to make sure that Canadian processors are informed and educated about Japanese methods and requirements. The objective is to have an industry which is ready to take advantage of any relaxation of Japanese import policies.

(3) Research should be conducted into the ramifications of the vertically segmented market system with reference to expanding opportunities in international markets. If this market structure does not provide clear incentives to farmers for producing output specifically for the export trade, alternatives should be proposed, studied and, if possible, promoted.

(4) Research should be conducted into the possible benefits of separate suppliers for the foreign and domestic market.

(5) A detailed examination of Canadian export policies and regulations should be conducted. The aim would be to discover what, if any, non-tariff barriers to exporting exist in Canada. These might include inspection procedures, packaging and labelling regulations, bureaucratic paper work and the speed of processing such paper work. Procedures developed for a world trade which was much less dynamic or demanding than today may now represent a detriment to trade. If problems exist, more expedient and efficient methods should be devised.

(6) In general, more research effort should be expended on the development of foreign markets and less on the problems of barriers to inter-provincial and inter-region trade, as the former will likely have a much higher payoff.

FOOTNOTES

1. Clearly, the growth or contraction of any industry will be determined by changes in relative prices. As these changes are a function of a large number of variables - e.g., technological change, cost of factor inputs, institutional changes, etc. - whose future trends are difficult to identify, we have assumed throughout this study no major change in relative prices, except those specifically discussed here.

2. Based on a 1000 lbs. slaughter steer at the average 1982 slaughter price in Winnipeg of $75.17 cwt. and a feeder steer of 750 lbs. at an average price in Winnipeg of $72.40/cwt. (Source: Livestock Market Review, 1982, Agriculture Canada).

3. These should be used with care as mixed farming leads to considerable double counting.

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TABLES

Table 1

MAIN INDICATORS OF MARKET GROWTH IN WESTERN CANADA

Population (Thousands)[1]	1960	1962	1964	1966	1968	1970	1972	1974	1976	1978	1980	1981	1982
Total - Western Canada	4698	4894	5071	5255	5464	5660	5890	6027	6247	6460	6795	6976	7096.3
B.C.	1606.0	1652.0	1738.0	1874.0	2007.0	2137.0	2247.0	2395.0	2466.6	2530.2	2666.1	2744.2	2777.2
Alta.	1283.0	1370.0	1432.0	1463.0	1526.0	1600.0	1653.0	1714.0	1838.0	1950.3	2142.6	2237.3	2306.0
Sask.	910.0	930.0	943.0	955.0	960.0	942.0	916.0	907.6	921.3	947.1	961.1	968.3	979.8
Man.	899.0	935.0	958.0	963.0	971.0	981.0	992.0	1011.0	1021.5	1032.4	1025.6	1026.2	1033.3
Average Weekly Wages & Salaries[1]													
B.C.	81.40	87.20	94.45	107.33	137.97	114.50	164.75	200.50	259.52	301.26	363.50	407.03	440.21
Alta.	77.04	82.01	86.67	94.86	100.86	128.15	149.97	178.72	236.89	276.32	341.93	390.40	427.85
Sask.	72.02	77.01	81.43	89.00	95.77	114.87	133.26	160.99	214.87	250.44	303.71	336.76	368.75
Man.	70.66	75.52	79.01	84.41	91.95	115.88	135.59	162.70	208.55	239.44	283.20	314.42	339.10
Per Capita Meat Consumption Canadian Average[2] (Kg.)													
All Meat	75.9	77.6	83.9	85.4	89.7	92.9	97.5	96.6	101.7	98.2	99.0	98.7	n.a.
Beef & Veal	34.7	35.5	39.3	41.3	41.7	40.8	44.4	45.1	53.6	47.5	41.2	42.5	n.a.
Pork	23.8	22.7	23.5	21.3	24.3	27.9	28.6	28.1	25.1	26.2	32.3	31.5	n.a.
Sheep & Goat	1.3	1.7	1.5	1.5	2.2	2.1	2.1	1.2	1.1	0.5	0.8	0.7	n.a.
Poultry	12.5	14.1	15.9	17.9	18.1	20.5	20.6	20.6	20.3	21.8	22.8	22.6	n.a.
Edible Offals	2.1	1.9	1.8	1.6	1.7	1.6	1.9	1.7	1.7	1.9	1.9	1.4	n.a.

SOURCES: 1. Canadian Statistical Review, Statistics Canada 11-003E.
2. Meat Balance in OECD Countries, OECD Paris.

Table 2

HUMAN POPULATION, LIVESTOCK PRODUCTION AND SLAUGHTER

HUMAN Population[1]	1962	1967	1972	1977	1981	1982
Total Canada	18,570	20,405	21,848	23,279	24,365	24,625
Total West	4,894	5,358	5,810	6,362	6,976	7,096
Western % of Total	26	26	27	27	29	29
Total Manitoba	935	963	992	1,029	1,026	1,033
% of Canada	5	5	5	4	4	4
% of West	19	18	17	16	15	15
Total Saskatchewan	930	958	916	938	968	980
% of Canada	5	5	4	4	4	4
% of West	19	18	16	15	14	14
Total Alberta	1,370	1,490	1,655	1,899	2,237	2,306
% of Canada	7	7	8	8	9	9
% of West	28	28	28	30	32	32
Total British Columbia	1,659	1,947	2,247	2,496	2,744	2,777
% of Canada	9	10	10	11	11	11
% of West	34	36	39	39	39	39
CATTLE Number on Farms[2] (000)						
Total Canada	12,067	12,697	13,643	14,293	13,364	13,050
Total West	6,695	7,386	8,539	8,750	8,503	8,284
Western % of Total	55	58	63	61	64	63
Total Manitoba	982	1,099	1,210	1,230	1,162	1,120
% Total Canada	8	9	9	9	9	9
% of West	15	15	14	14	14	14

Table 2 (Continued)

	1962	1967	1972	1977	1981	1982
Total Saskatchewan	2,174	2,350	2,811	2,780	2,401	2,365
% of Total Canada	18	19	21	19	18	18
% of West	32	32	33	32	28	29
Total Alberta	3,035	3,393	3,924	4,035	4,153	4,021
% of Total Canada	25	27	29	28	31	31
% of West	45	46	46	46	49	49
Total British Columbia	504	544	594	705	787	778
% of Total Canada	4	4	5	5	6	6
% of West	8	7	7	8	9	9
CATTLE SLAUGHTER - Federally Inspected Plants[2] (000)						
Total Canada	2,738	3,380	3,281	4,407	3,563	3,706
Total West	1,250	1,716	1,791	2,503	1,894	2,005
Western % of Total	46	51	55	57	53	54
Total Manitoba	402	536	456	599	307	342
% of Canada	15	16	14	14	9	9
% of West	32	31	25	24	16	17
Total Saskatchewan	126	163	173	213	205	240
% of Canada	5	5	5	5	6	6
% of West	10	9	10	9	11	12
Total Alberta	633	914	1,127	1,631	1,302	1,327
% of Canada	23	27	34	37	37	36
% of West	51	53	63	65	69	66

Table 2 (Continued)

	1962	1967	1972	1977	1981	1982
Total British Columbia	89	103	35	60	80	96
% of Canada	3	3	1	1	2	3
% of West	7	6	2	2	4	5
HOGS						
Number on Farms[2] (000)						
Total Canada	4,993	6,140	6,944	6,154	10,189	10,034
Total West	1,889	1,947	3,454	2,182	3,008	3,045
Western % of Total	38	32	50	35	30	30
Total Manitoba	349	593	922	655	893	900
% of Canada	7	10	13	11	9	9
% of West	18	30	27	30	30	30
Total Saskatchewan	400	552	955	501	625	645
% of Canada	8	9	14	8	6	6
% of West	21	28	28	23	21	21
Total Alberta	1,101	1,337	1,523	996	1,240	1,230
% of Canada	22	22	22	16	12	12
% of West	58	69	44	44	41	40
Total British Columbia	39	55	54	60	250	270
% of Canada	1	1	1	1	2	3
% of West	2	3	2	3	8	9
HOGS SLAUGHTER - Federally Inspected Plants[2] (000)						
Total Canada	6,031	7,337	9,357	8,007	12,844	12,701
Total West	2,646	2,938	4,213	2,577	3,610	3,450
Western % of Total	44	40	45	32	28	27

Table 2 (Continued)

	1962	1967	1972	1977	1981	1982
Total Manitoba	681	894	1,238	828	1,117	1,068
% of Canada	11	12	13	10	9	8
% of West	26	30	29	32	31	31
Total Saskatchewan	377	460	979	547	508	524
% of Canada	6	6	10	7	4	4
% of West	14	16	23	21	14	15
Total Alberta	1,351	1,407	1,872	1,156	1,686	1,569
% of Canada	22	19	20	14	13	12
% of West	51	48	44	45	47	45
Total British Columbia	237	177	124	46	299	271
% of Canada	4	2	1	1	2	2
% of West	9	6	3	2	8	8

SOURCES: 1. Canadian Statistical Review, Statistics Canada 11-003E.
2. Livestock and Animal Products Statistics, Statistics Canada 23-203.

Table 3

THE SHEEP INDUSTRY

SHEEP SLAUGHTER - Inspected Establishments (Number of Animals)	1962	1967	1972	1977	1981	1982
Total Canada	567,463	325,568	214,769	132,585	175,868	201,995
Total West	282,609	151,082	95,441	56,106	68,456	88,625
Western % of Total	50	46	44	42	39	44
Total Manitoba	92,677	46,672	19,854	5,926	5,013	5,634
% of Canada	16	14	9	4	3	3
% of West	33	31	21	11	7	6
Total Saskatchewan	20,948	8,232	2,673	645	526	804
% of Canada	4	3	1	0.5	0.3	0.4
% of West	7	5	3	1	1	1
Total Alberta	95,132	60,868	52,885	45,254	56,849	77,748
% of Canada	17	19	25	34	32	38
% of West	34	40	55	80	83	88
Total British Columbia	73,852	34,310	20,029	4,281	6,068	4,439
% of Canada	13	11	9	3	3	2
% of West	26	23	21	8	9	5
CONSUMPTION (000 LBS.)						
Domestic Disappearance	n.a.	85,021	101,472	42,077	38,052	40,396
Imports	n.a.	60,649	80,379	29,929	22,085	23,093
Imports % of Total Disappearance	n.a.	71	78	71	58	57

SOURCE: Livestock and Animal Products Statistics, Statistics Canada 23-209

Table 4

OUTPUT OF CHICKEN MEAT IN CANADA
(000's of pounds)

	1962[1]	1967[1]	1972[2]	1977[2]	1981[2]	1982[2]
Total Canada	411,513	598,752	736,859	790,878	948,730	945,890
Total West	113,533	151,644	194,897	211,255	276,728	272,186
Western % of Total	28	25	26	27	29	29
Total Manitoba	21,795	32,734	40,265	41,006	47,128	46,829
% of Canada	5	5	5	5	5	5
% of West	19	22	21	19	17	17
Total Saskatchewan	20,776	23,680	30,074	28,683	31,550	31,933
% of Canada	5	4	4	4	3	3
% of West	18	16	15	14	11	12
Total Alberta	36,664	51,942	63,010	71,491	95,790	101,130
% of Canada	9	9	9	9	10	10
% of West	32	34	32	34	35	37
Total British Columbia	34,298	43,288	61,548	70,075	102,260	92,294
% of Canada	8	7	8	9	11	10
% of West	30	29	32	33	37	34

SOURCES: 1. Quarterly Review of Agricultural Statistics, Statistics Canada, 21-003
2. Statistics Canada, Production of Poultry and Eggs, 23-202

Table 5

CANADIAN PRODUCTION QUOTA SET BY THE CANADIAN CHICKEN MARKETING AGENCY

	1979[1]		1980[1]		1981[1]		1982[1]		1983(B)[2]	
	Allocation (000 lbs.)	% of National	Allocation (000 lbs.)	% of National	Allocation (000 lbs.)	% of National	Allocation (000 lbs.)	% of National	Allocation (000 lbs.)	% of National
Total Canada	848,546		873,400		826,000		848,891		821,654	
B.C.	91,000	10.72	92,000	10.53	88,000	10.65	90,433	10.65	86,000	10.46
Alberta (A)	73,000	8.60	69,300	7.94	65,524	7.93	67,335	7.93	64,000	7.79
Saskatchewan	17,170	2.02	21,000	2.40	18,012	2.18	18,506	2.18	21,370	2.60
Manitoba	34,500	4.07	33,000	3.78	33,500	4.06	34,423	4.06	33,402	4.06
Ontario	294,000	34.65	298,000	34.12	284,669	34.46	292,531	34.46	282,650	34.40
Quebec	277,000	32.64	295,000	33.78	271,424	32.86	278,915	32.86	269,300	32.78
N.B.	21,700	2.56	23,000	2.63	22,271	2.70	22,886	2.70	22,920	2.79
N.S.	30,000	3.54	31,500	3.61	31,000	3.75	31,859	3.75	30,749	3.74
P.E.I.	1,176	0.14	2,100	0.24	2,100	0.25	2,156	0.25	1,600	0.19
Newfoundland (A)	9,000	1.06	8,500	0.97	9,500	1.15	9,847	1.16	9,663	1.18

(A) Non-Participating Provinces, Nfld. to 1981.
(B) Revised Allocation.

SOURCES: 1. Canada Gazette
2. Canada Poultryman

Table 6

OUTPUT OF TURKEY MEAT IN CANADA
(000's of lbs.)

	1962[1]	1967[1]	1972[2]	1977[2]	1981[2]	1982[2]
Total Canada	147,155	207,639	210,445	208,440	209,950	214,520
Total West	63,839	67,923	66,144	63,326	63,482	66,834
Western % of Total	43	33	31	30	30	31
Total Manitoba	18,961	19,849	18,360	17,257	16,498	17,882
% of Canada	13	10	9	8	8	8
% of West	30	29	28	27	26	27
Total Saskatchewan	18,422	10,751	10,482	9,005	8,998	10,406
% of Canada	13	5	5	4	4	5
% of West	29	16	16	14	14	16
Total Alberta	16,633	19,391	18,272	17,332	19,477	17,701
% of Canada	11	9	9	8	9	8
% of West	26	29	28	27	31	26
Total British Columbia	9,823	17,932	19,030	19,732	18,539	20,845
% of Canada	7	9	9	9	9	10
% of West	15	26	29	31	29	31

SOURCES: 1. Quarterly Bulletin of Agricultural Statistics, Statistics Canada, 21-003
2. Production of Poultry and Eggs, Statistics Canada, 23-202

Table 7

MOVEMENT OF CATTLE
West to East
(number of head)

	1962	1967	1972	1977	1981	1982
Feeder Cattle	207,511	463,469	369,555	232,059	489,318	569,228
Slaughter Cattle	69,962	169,872	148,856	71,451	65,605	78,262

SOURCES: Livestock Market Review

Table 8

FEED FREIGHT ASSISTANCE PAYMENTS

	1961-62 Shipments		1966-67 Shipments		1971-72 Shipments		1975-76 Shipments			1977-78 Shipments		1980-81 Shipments	
	10^3 t	$/t	10^3 t	$/t	10^3 t	$/t	10^3 t	$/t	POLICY CHANGE	10^3 t	$/t	10^3	$/t
Ontario	516	5.69	804	5.63	550	4.58	463	5.26		12	7.97	11	8.95
Quebec	810	8.91	1,170	8.74	1,265	7.47	1,159	9.02		1,111	3.22	1,167	3.38
N.B.	70	15.32	70	15.93	97	13.57	93	13.03		110	13.38	133	13.46
N.S.	118	16.01	134	14.38	173	10.23	170	10.15		176	11.36	208	11.47
P.E.I.	20	15.52	27	16.63	42	14.61	26	13.97		29	14.51	38	14.99
Newfoundland	18	29.63	21	27.76	39	18.70	28	19.05		34	22.65	44	26.99

SOURCE: Annual Report, Canada Livestock Feed Board.

Table 9

RAILWAY FREIGHT RATE INCREASES ON SUSPENDED BEEF
FROM CALGARY TO TORONTO AND MONTREAL
(Basis - 60,000 lbs., Cars - 100 cattle)

Date	Rate Per Cwt. ($)	Increase (%)	Cost Per Carcass ($)
Dec. 31/74	3.50	—	21.00
Jan. 1/75	4.03	15.1	24.18
Feb. 15/75	4.55	12.9	27.30
May 5/75	4.78	5.1	28.68
Jan. 1/76	5.05	5.6	30.30
Sept. 1/76	5.16	2.2	30.96
Jan. 1/78	5.39	4.5	32.34
Jan. 1/79	5.71	5.9	34.26
June 12/79	5.81	1.8	34.86
July 1/79	5.92	1.9	35.52
Feb. 1/80	6.52	10.1	39.12
Jan. 1/81	7.21	10.6	43.26
May 15/81	7.42	2.9	44.52
Aug. 1/81	7.59	2.3	45.54
Jan. 1/81	8.51	12.0	51.06
Feb. 2/83	9.02	6.0	54.12

SOURCE: Mimeo. Canadian Meat Council, February, 1983.

Table 10

CATTLE EXPORTED TO THE UNITED STATES
(number of head)

Slaughter Cattle and Calves	1962	1967	1972	1977	1981	1982
Total Canada	484,922	226,691	261,747	278,083	156,543	199,501
Total West	n.a.	n.a.	n.a.	158,721	72,381	124,475
West % of Total				57	46	62
Total Manitoba	n.a.	n.a.	n.a.	n.a.	24,368	43,505
% of Canada					16	22
% of West					34	35
Total Saskatchewan	n.a.	n.a.	n.a.	n.a.	9,329	18,423
% of Canada					6	9
% of West					13	15
Total Alberta	n.a.	n.a.	n.a.	n.a.	14,830	22,466
% of Canada					9	11
% of West					20	18
Total British Columbia	n.a.	n.a.	n.a.	n.a.	23,854	40,081
% of Canada					15	20
% of West					33	32

Table 10 (Continued)

Feeder Cattle and Calves	1962	1967	1972	1977	1981	1982
Total Canada	n.a.	n.a.	n.a.	98,119	44,745	83,165
Total West	n.a.	n.a.	n.a.	97,493	35,094	82,146
West % of Total				99%	78.4	99
Total Manitoba	n.a.	n.a.	n.a.	n.a.	9,155	27,029
% of Canada					20	33
% of West					26	33
Total Saskatchewan	n.a.	n.a.	n.a.	n.a.	20,113	27,800
% of Canada					45	34
% of West					57	34
Total Alberta	n.a.	n.a.	n.a.	n.a.	218	17,577
% of Canada					0.4	21
% of West					1	21
Total British Columbia	n.a.	n.a.	n.a.	n.a.	5,608	9,740
% of Canada					13	12
% of West					16	12

SOURCE: Livestock Market Review

Table 11

MEAT AND MEAT PRODUCTS EXPORTED, 1982

	United States		Japan		Other	
	Quantity CWT.	Value $	Quantity CWT.	Value $	Quanity CWT.	Value $
A. Beef, Fresh or Chilled, Boneless						
Total Canada	373,644	48,758,614	1,944	465,006	2,381	355,525
Total West	17,770	2,127,709	1,061	218,325	33	14,588
Manitoba	2,312	226,618	—	—	—	—
Saskatchewan	7,203	815,254	—	—	—	—
Alberta	7,438	975,741	1,061	218,325	33	14,588
British Columbia	817	110,096	—	—	—	—
B. Beef, Frozen Boneless						
Total Canada	563,862	60,315,387	53,935	11,368,459	36,745	4,536,193
Total West	153,026	15,650,942	25,882	5,825,635	53	10,490
Manitoba	22,519	2,157,832	4,330	968,233	—	—
Saskatchewan	16,271	1,871,208	2,589	542,062	—	—
Alberta	111,680	11,292,193	15,459	3,603,558	53	10,490
British Columbia	2,556	329,709	3,504	711,782	—	—
C. Beef, Fresh or Frozen N.E.S.						
Total Canada	283,437	28,970,206	4,292	886,536	7,577	948,491
Total West	246,761	25,006,764	2,288	507,014	29	5,366
Manitoba	19,481	1,624,704	438	97,666	29	5,366
Saskatchewan	54,210	5,600,150	319	66,234	—	—
Alberta	171,837	17,652,179	973	216,474	—	—
British Columbia	1,233	129,731	558	126,640	—	—

Table 11 (Continued)

	United States		Japan		Other	
	Quantity CWT.	Value $	Quantity CWT.	Value $	Quanity CWT.	Value $
D. Veal, Fresh or Frozen, Boneless						
Total Canada	556	64,389	—	—	952	150,644
Total West	210	27,080	—	—	—	—
Manitoba	—	—	—	—	—	—
Saskatchewan	—	—	—	—	—	—
Alberta	—	—	—	—	—	—
British Columbia	210	27,080	—	—	—	—
E. Veal, Fresh or Frozen, N.E.S.						
Total Canada	7,571	912,356	—	—	575	131,952
Total West	—	—	—	—	—	—
Manitoba	—	—	—	—	—	—
Saskatchewan	—	—	—	—	—	—
Alberta	—	—	—	—	—	—
British Columbia	—	—	—	—	—	—
F. Mutton and Lamb, Fresh or Frozen						
Total Canada	1,874	415,101	—	—	708	126,726
Total West	410	33,081	—	—	378	20,578
Manitoba	374	25,489	—	—	—	—
Saskatchewan	—	—	—	—	—	—
Alberta	—	—	—	—	—	—
British Columbia	36	7,592	—	—	378	20,578
G. Pork Bellies, Fresh or Frozen						
Total Canada	337,923	38,338,262	16,318	2,521,607	9,677	839,124
Total West	44,071	4,347,709	2,226	342,224	649	35,485
Manitoba	27,128	2,693,468	810	149,766	249	22,602
Saskatchewan	6,243	601,225	317	47,304	400	12,883
Alberta	6,383	610,838	16	4,123	—	—
British Columbia	4,317	442,178	1,083	141,031	—	—

Table 11 (Continued)

	United States		Japan		Other	
	Quantity CWT.	Value $	Quantity CWT.	Value $	Quanity CWT.	Value $
H. Hams, not Cured or Cooked						
Total Canada	1,038,460	117,836,939	90,149	16,696,700	24,946	2,989,234
Total West	82,451	8,577,448	21,515	4,134,257	8,805	1,047,862
Manitoba	66,355	6,718,567	5,609	1,040,053	4,128	492,780
Saskatchewan	1,164	183,706	2,800	555,677	--	—
Alberta	13,361	1,479,611	5,191	948,211	1,386	170,784
British Columbia	1,571	195,564	7,915	1,590,316	3,291	384,298
I. Pork Spare Ribs, Fresh or Frozen						
Total Canada	27,052	3,921,118	340	47,098	2,988	445,698
Total West	1,040	169,370	—	—	—	—
Manitoba	--	--	—	—	--	--
Saskatchewan	1,040	169,370	—	—	--	--
Alberta	--	--	—	—	--	--
British Columbia	—	—	—	—	--	--
J. Pork, Fresh or Frozen, N.E.S.						
Total Canada	1,000,282	109,032,030	858,324	181,976,119	76,584	8,750,943
Total West	114,113	12,750,693	130,453	27,855,224	16,229	1,649,162
Manitoba	36,148	3,557,691	37,161	8,016,646	6,804	627,291
Saskatchewan	48,899	6,187,885	33,615	7,065,783	1,018	96,769
Alberta	19,148	1,942,222	18,622	4,004,449	4,312	414,922
British Columbia	9,918	1,062,895	41,055	8,768,346	4,095	510,180
K. Fancy Meats, Bouine Fresh or Frozen						
Total Canada	47,709	2,980,982	9,197	1,348,422	428,506	17,648,731
Total West	17,365	881,420	2,593	415,420	189,758	7,978,940
Manitoba	2,642	209,309	150	32,850	129,853	3,367,671
Saskatchewan	214	18,891	—	—	7,557	601,179
Alberta	14,509	653,220	2,338	369,094	52,288	4,004,090
British Columbia	—	—	105	13,476	60	6,000

Table 11 (Continued)

	United States		Japan		Other	
	Quantity CWT.	Value $	Quantity CWT.	Value $	Quanity CWT.	Value $
L. Fancy Meats, Pork, Fresh or Frozen						
Total Canada	591,551	21,608,569	6,410	416,584	592,473	16,756,776
Total West	85,262	3,319,317	3,938	234,422	124,221	3,337,742
Manitoba	30,809	1,057,406	31	2,785	85,347	1,945,329
Saskatchewan	13,257	718,277	416	30,715	11,635	349,468
Alberta	28,336	999,826	947	62,825	14,744	545,633
British Columbia	12,860	543,808	2,544	138,097	12,495	497,312
M. Meats, Fresh or Frozen, N.E.S.						
Total Canada	4,315	857,809	--	--	1,893	263,101
Total West	1,533	234,194	11	2,704	1,047	167,965
Manitoba	1,529	233,594	--	--	638	119,019
Saskatchewan	—	—	--	--	405	47,946
Alberta	—	--	--	--	--	--
British Columbia	4	600	11	2,704	4	1,000
N. Beef-Cured						
Total Canada	983	265,512	--	--	44,360	2,968,139
Total West	135	40,602	--	--	1,208	39,227
Manitoba	--	--	--	--	938	18,052
Saskatchewan	--	—	--	--	--	--
Alberta	30	12,492	--	--	--	--
British Columbia	105	27,975	--	--	270	21,175
O. Bacon-Cured						
Total Canada	18,256	2,365,933	400	107,681	5,665	1,226,480
Total West	4,647	984,576	--	--	233	34,580
Manitoba	--	--	--	--	--	--
Saskatchewan	—	--	--	--	--	--
Alberta	155	44,898	--	--	--	--
British Columbia	4,492	939,678	--	--	233	34,580

Table 11 (Continued)

	United States		Japan		Other	
	Quantity CWT.	Value $	Quantity CWT.	Value $	Quanity CWT.	Value $
P. Hams-Cured						
Total Canada	4,003	1,170,478	105	43,212	1,021	170,795
Total West	2,529	724,322	—	--	--	—
Manitoba	—	--	--	--	--	--
Saskatchewan	—	—	--	--	--	--
Alberta	35	11,723	--	--	--	--
British Columbia	2,484	712,599	—	--	--	--
Q. Pork, Cured, N.E.S.						
Total Canada	2,515	381,553	435	100,963	12,310	802,924
Total West	157	17,168	31	6,550	1,301	143,017
Manitoba	—	--	--	--	467	41,358
Saskatchewan	—	—	31	6,550	399	40,369
Alberta	—	--	--	--	--	--
British Columbia	157	17,168	—	--	435	59,989
R. Fancy Meats, Edible Offal Cured						
Total Canada	374	21,250	--	--	26,121	1,199,491
Total West	150	5,329	--	--	--	--
Manitoba	—	--	--	--	--	--
Saskatchewan	—	—	--	--	--	--
Alberta	150	5,329	—	--	--	--
British Columbia	—	—	--	--	--	—
S. Meat, Cured, N.E.S.						
Total Canada	345	77,296	7	1,751	12,601	644,379
Total West	29	6,513	7	1,751	--	--
Manitoba	—	--	--	--	--	--
Saskatchewan	--	--	--	--	--	--
Alberta	—	--	--	--	--	--
British Columbia	29	6,513	7	1,751	--	--

Table 11 (Continued)

	United States		Japan		Other	
	Quantity CWT.	Value $	Quantity CWT.	Value $	Quanity CWT.	Value $
T. Sausage, Fresh, Including Frozen	LBS.		LBS.		LBS.	
Total Canada	321,143	557,143	--	--	81,013	125,983
Total West	299,253	518,933	--	--	--	--
Manitoba	--	--	--	--	--	--
Saskatchewan	--	--	--	--	--	--
Alberta	--	--	--	--	--	--
British Columbia	299,253	518,933	--	--	--	--
U. Sausage, Cured, Including Frozen	LBS.		LBS.		LBS.	
Total Canada	4,031,844	8,951,039	12,025	32,308	1,416,180	2,023,207
Total West	2,491,027	578,447	2,725	8,101	46,480	185,912
Manitoba	--	--	--	--	1,055	6,764
Saskatchewan	--	--	--	--	--	--
Alberta	27,527	84,170	--	--	--	--
British Columbia	2,463,500	5,700,277	2,725	8,101	46,480	185,912
V. Boiled Ham, Cooked						
Total Canada	189,539	428,784	719	3,237	2,684	8,379
Total West	138,461	330,329	--	--	--	--
Manitoba	--	--	--	--	--	--
Saskatchewan	122,622	287,309	--	--	--	--
Alberta	3,365	8,579	--	--	--	--
British Columbia	12,474	34,404	--	--	--	--

Table 11 (Continued)

	United States		Japan		Other	
	Quantity CWT.	Value $	Quantity CWT.	Value $	Quanity CWT.	Value $
W. Cooked Meat and Prep. Not Canned						
Total Canada	292,961	948,185	19,088	17,081	298,754	584,086
Total West	116,910	542,074	1,243	15,140	22,037	35,171
Manitoba	--	--	--	--	--	--
Saskatchewan	--	--	--	--	--	--
Alberta	19,473	47,181	820	13,640	21,105	30,331
British Columbia	97,437	494,893	423	1,500	932	4,840
X. Hams, Canned						
Total Canada	1,824,901	4,194,961	1,560	3,520	77,384	159,585
Total West	1,782,271	4,130,604	--	--	--	--
Manitoba	--	--	--	--	--	--
Saskatchewan	1,510,195	3,513,584	--	--	--	--
Alberta	271,629	615,622	--	--	--	--
British Columbia	447	1,398	--	--	--	--
Y. Pork, Canned, N.E.S.						
Total Canada	41,497	18,430	360	723	89,490	128,003
Total West	39,817	14,829	--	--	28,800	25,853
Manitoba	--	--	--	--	--	--
Saskatchewan	39,817	14,829	--	--	--	--
Alberta	--	--	--	--	--	--
British Columbia	--	--	--	--	28,800	25,853

Table 11 (Continued)

	United States		Japan		Other	
	Quantity CWT.	Value $	Quantity CWT.	Value $	Quanity CWT.	Value $
Z. Meat & Meat Prep. Canned, N.E.S.						
Total Canada	1,516,350	3,564,984	19,088	17,081	517,558	740,540
Total West	63,225	109,692	19,088	17,081	19,901	34,519
Manitoba	—	—	—	—	—	—
Saskatchewan	—	—	—	—	—	—
Alberta	41,902	86,690	—	—	2,196	2,744
British Columbia	21,323	23,002	19,088	17,081	17,705	31,775

SOURCE: Statistics Canada

Table 12

SLAUGHTER HOGS EXPORTED TO THE UNITED STATES
(number of head)

	1962	1967	1972	1977	1981	1982
Total Canada	2,670	17,191	87,445	14,724	66,533	212,120
Total West	n.a.	n.a.	n.a.	8,958	60,218	132,494
West % of Total				61	91	63
Total Manitoba	n.a.	n.a.	n.a.	n.a.	28,081	84,010
% of Canada					42	40
% of West					47	63
Total Saskatchewan	n.a.	n.a.	n.a.	n.a.	8,039	29,208
% of Canada					12	14
% of West					13	22
Total Alberta	n.a.	n.a.	n.a.	n.a.	23,961	1,523
% of Canada					36	0.7
% of West					40	1
Total British Columbia	n.a.	n.a.	n.a.	n.a.	137	17,753
% of Canada					0.2	8
% of West					0.2	13

SOURCE: Livestock Market Review

Table 13

SHEEP AND LAMBS EXPORTED TO THE UNITED STATES

Slaughter and Feeder Sheep and Lambs	1962	1967	1972	1977	1981	1982
Total Canada	20,494	10,657	13,888	8,590	1,969	8,837
Total West	n.a.	n.a.	n.a.	8,171	793	8,832
West % of Total				95	40	100
Total Manitoba	n.a.	n.a.	n.a.	n.a.	776	1,182
% of Canada					98	13
% of West					39	13
Total Saskatchewan	n.a.	n.a.	n.a.	n.a.	—	1,589
% of Canada					0	18
% of West					0	18
Total Alberta	n.a.	n.a.	n.a.	n.a.	3	5,625
% of Canada					0.4	64
% of West					0.2	64
Total British Columbia	n.a.	n.a.	n.a.	n.a.	14	436
% of Canada					2	5
% of West					0.7	5

SOURCE: Livestock Market Review

Table 14

WESTERN FARM CASH RECEIPTS, 1981

	Manitoba ($000)	Saskatchewan ($000)	Alberta ($000)	B.C. ($000)
Cattle	249,770	383,244	1,146,810	101,821
Calves	37,470	74,028	32,127	17,709
Hogs	138,885	80,333	19,446	44,327
Sheep & Lambs	876	3,056	6,010	1,960
Poultry	41,065	25,653	78,299	81,793
Total Livestock	468,066	566,314	1,458,692	247,610
Total Farms	1,655,215	4,010,306	3,880,793	863,940
Livestock % of Total Farms	28	14	38	29

SOURCE: Statistics Canada 21-202

Table 15

NUMBER OF FARMS REPORTING FARM ANIMALS, 1981 CENSUS

	Manitoba	Saskatchewan	Alberta	B.C.
Cows Mainly for Beef	12,004	27,753	29,739	6,613
Cattle on Feed	6,336	11,624	12,851	4,945
Pigs	5,098	9,177	9,994	2,348
Sheep	598	1,132	2,332	1,590
Hens and Chickens (not layers)	5,926	14,905	13,280	4,898
Turkeys	1,380	4,843	4,445	1,132

SOURCE: Census of Canada, 1981

Table 16

MANUFACTURING ACTIVITY, 1980

	Manitoba		Saskatchewan		Alberta		B.C.	
	Value of Shipments ($000)	Value Added ($000)	Value of Shipments ($000)	Value Added ($000)	Value of Shipments ($000)	Value Added ($000)	Value of Shipments ($000)	Value Added ($000)
Meat and Poultry Products	530,741	86,603	n.a.	n.a.	1,651,158	130,876	415,161	97,599
Slaughter and Meat Processors	470,928	71,387	290,771	60,801	1,565,983	105,000	324,944	77,554
Poultry Processors	59,813	15,216	n.a.	n.a.	85,175	25,842	90,217	20,044
Total Livestock	1,061,482	173,206	290,771[1]	60,801[1]	3,302,316	261,718	830,322	195,197
Total Food and Beverage	1,308,700	320,427	766,615	197,658	3,925,456	559,405	2,172,106	687,486
% Livestock of Food and Beverage	81%	54%	38%[1]	31%[1]	84%	47%	38%	28%
Total Manufacturing	4,363,707	1,769,880	2,106,741	788,388	10,520,744	3,375,789	15,893,050	6,566,549
% Livestock of Total Manufacturing	24%	10%	14%[1]	8%[1]	31%	8%	5%	3%

SOURCE: Statistics Canada, 31-203

1. Includes only slaughter and meat processors.

Table 17

RED MEAT AND POULTRY PROCESSING VALUE-ADDED
($000,000)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
West											
- Red Meat	136	158	165	187	240	267	276	316	338	367	315
- Poultry[1]	10	15	20	24	24	29	40	45	59	59	61
Total[1]	146	173	185	211	264	296	316	361	397	426	374
Manitoba											
- Red Meat	30	36	35	43	53	61	64	71	74	79	71
- Poultry	3	3	5	6	6	7	9	13	16	15	15
Total	33	39	40	49	59	68	73	84	90	94	86
Saskatchewan											
- Red Meat	20	23	25	27	37	35	28	25	25	43	61
- Poultry	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total	20	23	25	27	37	35	28	25	25	43	61
Alberta											
- Red Meat	65	74	78	87	114	135	142	170	169	175	105
- Poultry	n/a	4	6	7	7	10	15	15	23	21	26
Total	65	78	84	94	121	145	157	185	192	196	131
British Columbia											
- Red Meat	21	25	27	30	36	36	42	50	70	70	78
- Poultry	7	8	9	11	11	12	16	17	20	23	20
Total	28	33	36	41	47	48	58	67	90	93	98

1. Excludes Saskatchewan poultry value-added.

SOURCE: Handbook of the food processing, distribution, and retailing sectors. Agriculture Canada. January, 1983.

Table 18

SLAUGHTER AND MEAT PROCESSING - EMPLOYMENT[1]
(number of persons)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Total Canada	31,099	31,332	31,293	30,937	32,836	32,993	33,237	33,322	34,812	34,565	35,912
Total West	11,063	11,452	11,497	11,367	12,136	12,705	13,010	13,160	12,757	11,966	12,131
West % of Total	36	37	37	37	37	39	39	39	37	35	34
Total Manitoba	2,935	2,947	2,864	2,874	3,085	3,250	3,462	3,402	3,381	3,276	2,876
% of Canada	9	9	9	9	9	10	10	10	10	9	8
% of West	27	26	25	25	25	26	27	26	27	27	24
Total Saskatchewan	1,569	1,656	1,707	1,574	1,673	1,507	1,297	1,332	1,290	1,325	1,401
% of Canada	5	5	5	5	5	5	4	4	4	4	4
% of West	14	14	15	14	14	12	10	10	10	11	12
Total Alberta	4,820	5,086	5,167	5,070	5,489	5,919	6,334	6,528	5,963	5,189	5,552
% of Canada	15	16	17	16	17	18	19	20	17	15	15
% of West	44	44	45	45	45	47	49	50	47	43	46
Total British Columbia	1,739	1,763	1,759	1,849	1,889	2,029	1,917	1,898	2,123	2,176	2,302
% of Canada	6	6	6	6	6	6	6	6	6	6	6
% of West	16	15	15	16	16	16	15	14	17	18	19

1. May not add due to rounding.

SOURCE: Handbook of the Food processing, Distribution and Retailing Sectors. Agriculture Canada. January, 1983.

Table 19

SLAUGHTERING AND MEAT PROCESSING - NUMBER OF ESTABLISHMENTS[1]

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Total Canada	453	460	468	473	487	477	467	430	491	524	547
Total West	134	134	138	144	149	156	157	148	168	184	192
West % of Total	30	29	29	30	31	33	34	34	34	35	35
Total Manitoba	28	28	27	27	27	31	30	28	30	36	37
% of Canada	6	6	6	6	6	6	6	7	6	7	7
% of West	21	21	20	19	18	20	19	19	18	20	19
Total Saskatchewan	21	20	22	22	27	27	28	27	27	36	39
% of Canada	5	4	5	5	6	6	6	6	5	7	7
% of West	16	15	16	15	18	17	18	18	16	20	20
Total Alberta	43	44	46	49	52	57	58	57	66	68	72
% of Canada	9	10	10	10	11	12	12	13	13	13	13
% of West	32	33	33	34	35	37	37	39	39	37	38
Total British Columbia	42	42	43	46	43	42	41	36	45	44	44
% of Canada	9	9	9	10	9	9	9	8	9	8	8
% of West	31	31	31	32	29	27	26	24	27	24	23

1. May not add due to rounding.

SOURCE: Handbook of the Food processing, Distribution and Retailing Sectors. Agriculture Canada. January, 1983.

Table 20

SLAUGHTER AND MEAT PROCESSING - VALUE ADDED[1]
($000,000)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Total Canada	363	404	429	530	635	712	788	835	953	1053	1185
Total West	136	158	165	187	240	267	276	316	338	367	315
Western % of Total	37	39	38	35	38	38	35	38	35	35	27
Total Manitoba	30	36	35	43	53	61	64	71	74	79	71
% of Canada	8	9	8	8	8	9	8	9	8	8	6
% of West	22	23	21	23	22	23	23	22	22	22	23
Total Saskatchewan	20	23	25	27	37	35	28	25	25	43	61
% of Canada	6	6	6	5	6	5	4	3	3	4	5
% of West	15	15	15	14	15	13	10	8	7	12	19
Total Alberta	65	74	78	87	114	135	142	170	169	175	105
% of Canada	18	18	18	16	18	19	18	20	18	17	9
% of West	48	47	47	47	46	51	51	54	50	48	34
Total British Columbia	21	25	27	30	36	36	42	50	70	70	78
% of Canada	6	6	6	6	6	5	5	6	7	7	6
% of West	15	16	16	16	15	13	15	16	21	19	24

1. May not add due to rounding.

SOURCE: Handbook of the Food processing, Distribution and Retailing sectors. Agriculture Canada. January, 1983.

Table 21

LOCAL MARKET PROJECTIONS TO 1997

Scenario 1	1982	1987	1992	1997
Population 2% Annual Growth (000)	7,096.3	7,834.9	8,650.4	9,550.7
Assuming Total Consumption Remaining Constant at 98.7 kg. Per Capita (See Table 1) Total Demand Meat million kg.	700.4	773.3	853.7	942.6
Assuming Total Consumption Mix Remains Constant at 1981 Levels (See Table 1) Total Demand for				
Beef and Veal, million kg.	301.5	332.9	367.6	405.9
Pork, million kg.	223.5	246.8	272.5	300.8
Poultry, million kg.	160.3	177.1	195.5	215.8
Scenario 2				
Assuming 2% Population Growth and Per Capita Consumption Levels Reach 1976 high of 101.7 kg. (See Table 1) by 1997: linear trend				
kg./capita/year	98.7	99.7	100.7	101.7
Total Demand for Meat, million kg.	700.4	781.1	871.1	971.3
Assuming Consumption Mix Remains at 1981 Levels (See Table 1) Total Demand for:				
Beef and Veal, million kg.	301.5	336.3	375.1	418.2
Pork, million kg.	223.5	249.3	278.0	309.9
Poultry, million kg.	160.3	178.8	199.5	222.4

Table 21 (Continued)

Scenario 3	1982	1987	1992	1997
Assuming 2% Population Growth and Per Capita Consumption Levels Reach 1981 U.S. Levels of 114.3 kg./capita (See Table 22) by 1997 - linear trend kg./capita/year	98.7	103.90	109.[illegible]	114.3
Total Demands For Meat, million kg.	700.4	814.0	943.8	1,091.6
Assuming Consumption Mix Remains at 1981 Canadian Levels (See Table 1) Total Demands for:				
Beef and Veal, million kg.	301.5	350.5	406.4	469.8
Pork, million kg.	223.5	259.8	301.2	348.4
Poultry, million kg.	160.3	186.4	216.1	249.9

Table 22

	Per Capita (kg./yr.) Consumption	GDP/Capita* in U.S.$
Canada	98.7	11,741
Japan	32.6	9,606
United States	114.3	12,647
Australia	110.8	10,763
New Zealand	101.9	7,957
Denmark	79.7	11,350
France	110.5	10,552
W. Germany	98.0	11,076
Greece	63.3	3,769
Ireland	95.3	4,855
Italy	76.5	6,123
United Kingdom	74.2	8,886
Turkey	24.5	1,262
Portugal	54.4	2,398

SOURCES: 1. OECD Dept. of Economics and Statistics 1952-1981. National Accounts. Volume I.
2. Meat Balances in OECD Countries 1976-1981.

*1981 prices and exchange rates.

Table 23

JAPANESE EXPORT MARKET, PROJECTIONS TO 1997

Japanese Export Scenario 1[1]	1982	1987	1992	1997
1. Beef and Veal, million kg. (Canada retains traditional 1% of the market)	301.5	334.8	371.5	411.7
2. Pork, million kg. (Canada retains 20% of total Japanese market)	223.5	285.8	350.5	417.8
Japanese Export Scenario 2				
1. Beef and Veal, million kg. (Canada gains total marginal increase in market for high-quality beef - about 20% of total Japanese market at present)	301.5	371.9	445.6	522.9
2. Pork, million kg. (Canada retains 20% of total market)	223.5	285.8	350.5	417.8

1. Based on assumption and projections of Local Market, Scenario 1, plus:
   (a) Japanese population remains at 117 million
   (b) per capita consumption of meat is allowed to increase in Japan by 10 kg. per year by 1997 (from 32.6 kg. to 42.6 kg.).
   (c) this increase will be divided equally between beef and pork.